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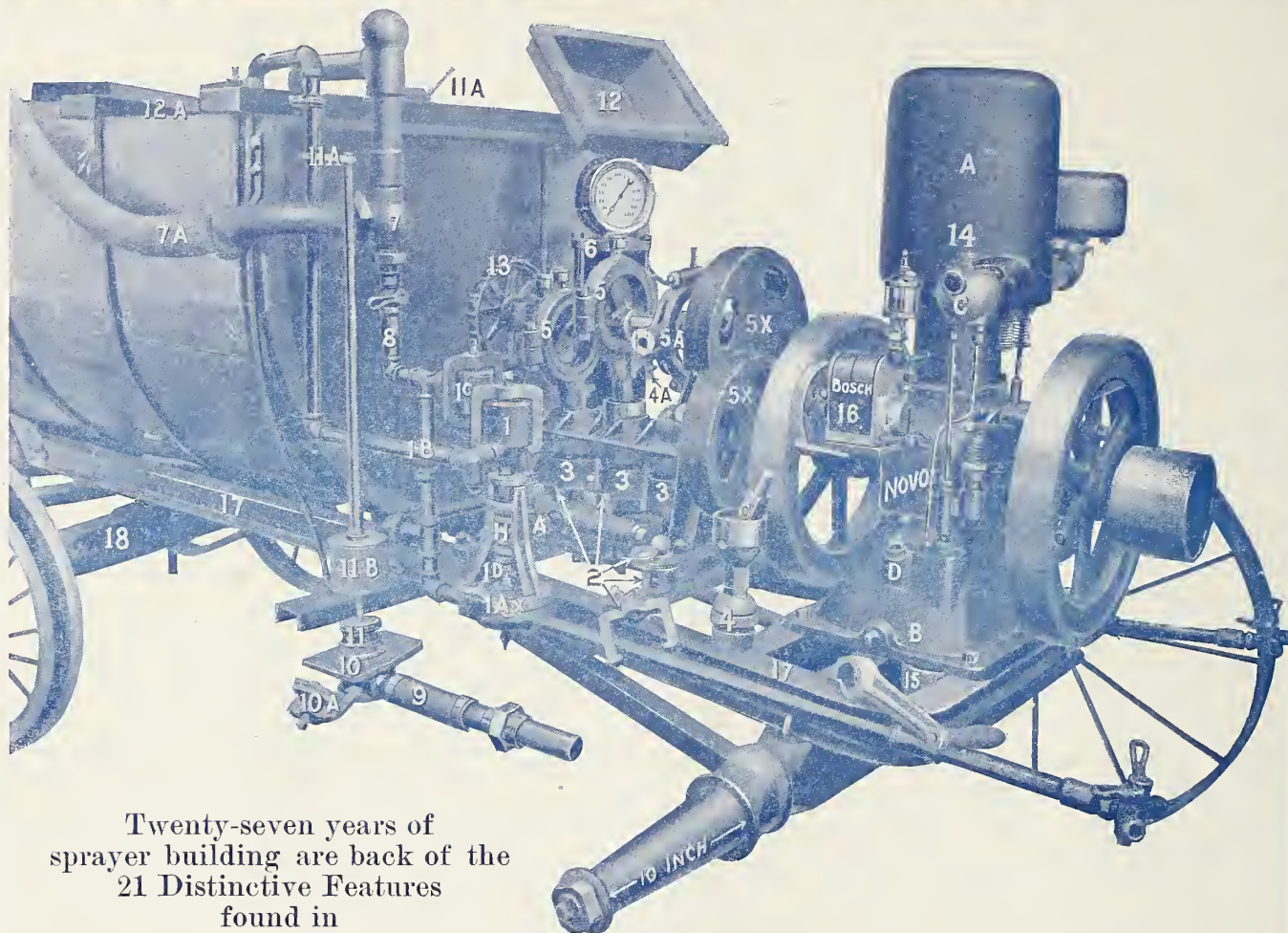


BETTER FRUIT

March, 1914

Volume VIII, Number 9

STARK
DELICIOUS
TRADE MARK



Twenty-seven years of
sprayer building are back of the
21 Distinctive Features
found in

Bean Power Sprayers

It's easy enough to put an engine and pump together and call the result a power sprayer—but an outfit like the Bean can't be built that way. The Bean line is the result of twenty-seven years' experience—and experience counts. Complete power outfits from \$135 up. Study the illustration when you read the list of features.

Immediate Deliveries from Various Northwest Points. Order Your Bean and Get Right to Work

- | | | |
|--|---|--|
| <p>1. Pressure Regulator. Not a safety valve, but a real pressure regulator. Safe, simple, efficient, dependable. Engine can be started against full pressure as easily as when there is no pressure. Saves $\frac{1}{4}$ to $\frac{1}{3}$ gasoline and same proportion of wear and tear in engine and pump. Read details of construction in our new catalog.</p> | <p>6. Boiler Tubing Air Chamber, the best to be had.</p> | <p>15. Gasoline Well Beneath Engine which insures gasoline for engine whether going up hill or down.</p> |
| <p>2. Patented Threadless Valves with reversible seats. Cannot corrode or stick tight.</p> | <p>7. Bean's Refiller, which has no movable parts. Will fill 200-gallon tank in 5 minutes.</p> | <p>16. Bosch High Tension Magneto eliminates all ignition troubles.</p> |
| <p>3. Porcelain Lined Cylinders which require no stuffing box.</p> | <p>8. Cut-Off Cock relieving pressure instantly.</p> | <p>17. One-Piece Steel "I" Bean Frame bolted direct to axle. Much superior to wood frames.</p> |
| <p>4. Moulded Plunger Packing. See catalog for description.</p> | <p>9. Underneath Suction, increasing capacity and never requiring priming.</p> | <p>18. Rocking Bolster on front axle so that tank always remains level.</p> |
| <p>5. Direct Connected Engine and Pump; no belt or connecting rod.</p> | <p>10. Iron Well bolted directly underneath tank.</p> | <p>19. Combined Tool Box and Foot-Board.</p> |
| | <p>11. Cut-Off and Strainer which fit inside tank. Simple to operate.</p> | <p>20. Grease Cup to lubricate front end of agitator shaft extends upward so liquid cannot run out of tank.</p> |
| | <p>12. Strainer Box which strains all liquid twice.</p> | <p>21. Complete Set of Extras with each outfit. Nothing has been overlooked in building the "Bean."</p> |
| | <p>13. Chain and Sprockets to drive agitator; no belt or bevel gears.</p> | |
| | <p>14. Efficient Engine, ample horse-power for each outfit.</p> | |

Send for Catalog 28-A 

For illustrations and detailed description of the entire Bean line of Hand and Power Sprayers and Pump Accessories. Cut the coupon.

Get Catalog 28-B for Bean Centrifugal Pumps
28-C for Bean Gas Engines

BEAN SPRAY PUMP CO. 213 West Julian Street
San Jose, California
Eastern Factory: Berea, Ohio

[Cut out this Coupon and Mail Today for Free Catalog]

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Gentlemen—Please mail me a copy of your Sprayer Catalog 28-A and tell me your nearest distributing point. Also send catalogs indicated below:

..... Catalog 28-B—Bean Centrifugal Pumps.
..... Catalog 28-C—Bean Gas Engines.

"Water, Water, Everywhere"

WHY BUY IT?

LILLY'S NIAGARA BRAND SOLUBLE SULPHUR

Eliminates the necessity of
paying freight on the water

The accompanying picture shows to some extent the advantages to be gained by using Lilly's Soluble Sulphur, but it does not tell the whole story.

It is the logical and scientific manner of handling sulphur spray. It can be stored indefinitely, will not freeze, there is no leaking, nothing offensive when handling, it can be sent you by Parcel Post.

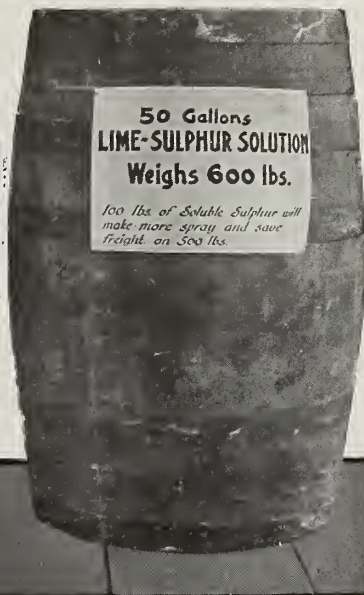
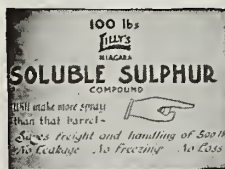
Lilly's Niagara Brand Soluble Sulphur is pure sulphur combined with a true solvent by an intricate process of which we have the exclusive rights in the West.

The following prices are F. O. B. Seattle or Portland. When ordering by Parcel Post kindly add Parcel Post charges:

100-lb. case (2 50-lb. cans) \$7.50 each	10-lb. can \$1.25 each
50-lb. can 4.00 each	5-lb. can75 each
25-lb. can 2.50 each	1-lb. can20 each

We still manufacture Lime & Sulphur in liquid form, but are getting ready to read the burial service over it.

THE CHAS. H. LILLY CO.
SEATTLE **PORTLAND**



HOME SIZE \$10 AND UP

Make Big Profits In Canning

"UNCLE SAM" SAYS

(Farmers' Bulletin 521): "Every well-regulated farm should have a home canner." Thousands of progressive Farmers, Fruit Growers and Gardeners have followed this advice and are making big profits on fruits and vegetables put up at home with "National" Steam Pressure Canning Outfits.

Advantages of Steam Pressure

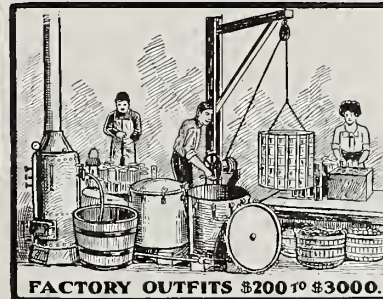
over the "hot water," or open boiler method of canning are explained on page 25 of Farmer's Bulletin 521: "Steam-pressure canners are the most successful * * * because the greater heat and pressure effect complete sterilization. Steam under pressure raises the heat to about 250 degrees F., and readily destroys all bacteria and spores in fruits and vegetables."

The "National" Sterilizes Perfectly

"Spoiled" canned goods are caused by the development of germ life due to imperfect sterilization. The "open boiler" method fails to kill all germs because the water turns into steam and escapes at 212° F. For perfect results "steam under pressure" is necessary. The intense heat generated absolutely kills all germs and spores. This is the unanswerable argument in favor of the National Steam Pressure Canner. It sterilizes foods of any kind perfectly so that they will keep indefinitely.

Mail Free Coupon Today

Free Catalog with full descriptions, illustrations and prices of all styles and sizes of National Steam Pressure Canning Outfits, with instructions for use, etc., sent free on request; also a FREE three months' subscription to "PROFITABLE CANNING," a magazine filled with valuable facts, figures and actual experiences of home canners for profit. Agents wanted. WRITE NOW.



FACTORY OUTFITS \$200 to \$3000.

"The National Steam Pressure Way"

With a "National" Steam Pressure Canning Outfit you can be independent of the commission houses and store buyers. No more fruit or vegetables rotting on the ground or fed to your hogs for lack of fair prices. You can now easily turn this loss into a big gain by canning peaches, pears, grape juice, berries, corn, peas, beans, tomatoes, etc. If the market is not favorable today—hold and sell tomorrow—next week—next month. You will find a ready demand for your output at prices that will make you a big profit.

Operation is Easy— Profits Are Sure

Any one can operate a "National" Canner. There's no mystery about it—no difficulty whatever. It is a simple, safe, easy, pleasant and healthful way to make money, and the investment is so small that a few days home canning pays for the outfit. You will find a ready market for all your output in the jobbing houses, stores, hotels, private families, etc.

**FREE
COUPON**

**NORTHWESTERN STEEL &
IRON WORKS**

928 Spring St., Eau Claire, Wis.

Please send me—Free—Catalog and full information about "National" Steam Pressure Canning Outfits; also a free three-months subscription to "PROFITABLE CANNING" Magazine.

Name

Address..... R. F. D.

County..... State.....



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 Ira B. Solomon Canning, N. S.
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OUR SPECIALTIES ARE APPLES AND PEARS

IF YOU WANT TO MARKET
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FRUIT

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ALWAYS SHIP TO

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FRUITS AND PRODUCE

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Top Prices and Prompt Returns

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Ship your Furniture
to us to be stored
until you are located

TRANSFER & LIVERY CO.
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Fruits and Produce

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Growers and Shippers of

**YAKIMA VALLEY FRUITS
AND PRODUCE**

Specialties: Apples, Peaches,
Pears and Cantaloupes

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Stop at "The Oregon," Hood River
Clean Rooms—Excellent Meals—One block from depot

Mark Levy & Co.

COMMISSION
MERCHANTS

Wholesale Fruits

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A PANORAMIC VIEW

of the

Famous Hood River Valley
showing

13,000 acres of apple orchards,
Mount Hood, Mount Adams and
the Columbia River Gorge.
40 inches long Price \$1.00

SLOCUM & CANFIELD'S BOOK AND ART STORE
Hood River, Oregon

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DOCTOR OF OPHTHALMOLOGY

EYES
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LENSES
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Over 30 Years' Experience

Telescopes, Field Glasses
Magnifiers to examine scale

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Oregon

and

Glenwood
Iowa

Arcadia Irrigated Orchards

The largest and most successful orchard project
in the entire West

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly.

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Arcadia Orchards Company
Deer Park, Washington

50c Free

That's the cost of each copy of my copy-righted descriptive Catalog No. 6 of

Trees, Shrubs, Vines and Plants

Write for a copy,

Mention this paper.

J. B. PILKINGTON, NURSEYMAN, PORTLAND, OREGON



When you get to Hood River
stop at the

Mt. Hood Hotel

Occupying one-half block; with
a new brick annex.

Rooms single of en suite
Twenty rooms with bath
Special rates to families

Trains stop daily in front of Hotel.
Bus meets all boats.

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PRINTERS AND BINDERS
PORTLAND, OREGON

THIS HOUSE is more than a house of type and presses. It serves business in any way business needs printing service. It connects printing with the business of the day. It accomplishes a definite purpose for its patrons.

It determines what kind of printing will give the best results and proceeds to that end with the best effort and with no neglect of detail.

Quality and Service are our guide-posts

WE INVITE INQUIRIES

We print "Better Fruit"

**ACID BLAST
ETCHED PLATES**
*We have installed
the only etching
machines in the
State of Oregon*
*Blast etched cuts
have a printing
quality which has
never before been
obtainable with
process engraved
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**THEY COST THE SAME
AS THE OTHER KIND**

**WE MAKE
CUTS
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**HICKS - CHATTEN
ENGRAVING CO.**
607 BLAKE-McFALL BLDG., PORTLAND, OREGON

Stanley-Smith Lumber Co.

HOOD RIVER, OREGON

WHOLESALE AND RETAIL

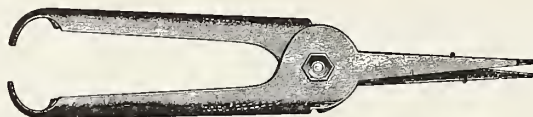
Lath, Shingles, Moulding and Slab Wood

Berry Crates and Fruit Packages of all kinds

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Send for Complete Catalogue

E. A. FRANZ CO., Hood River, Oregon

**"WE STARTED RIGHT
AND WE ARE RIGHT"**

6458 Acres

IN OUR ENTERPRISE

4178 Acres

ALL IN APPLES

Nine miles continuous rows of trees, the largest apple orchard ever planted. All are one, two and three years old; the two and three year old all sold, amounting to over 3,000 acres.

We are now offering our one year at terms to suit you.

We give five years', from date of planting, free care. Our company is unlike others in the feature of staying with our purchasers after the free care period. Our plans make our interests mutual; we all work together for the interest of all.

Our Booklet will give you a simple statement of our dealings and methods. Write us for information.

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Portland, Oregon

The First National Bank

Hood River, Oregon

F. S. STANLEY, *President*
J. W. HINRICH, *Vice President*
E. O. BLANCHARD, *Cashier*
V. C. BROCK, *Assistant Cashier*
C. D. HINRICH, *Assistant Cashier*

Savings Department
Safe-Deposit Boxes
Interest on Time Deposits

Careful attention given to business
of non-resident clients

Capital and Surplus \$134,000
Total Assets over \$600,000

LESLIE BUTLER, *President*
TRUMAN BUTLER, *Vice President*
C. H. VAUGHAN, *Cashier*

Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital fully paid \$100,000

INTEREST PAID ON TIME DEPOSITS

We give special attention to Good Farm Loans

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

LADD & TILTON BANK

Established 1859

Oldest bank on the Pacific Coast

PORTLAND, OREGON

Capital \$1,000,000.00

Surplus 1,000,000.00

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R. S. Howard, Jr., *Assistant Cashier*
J. W. Ladd, *Assistant Cashier*
Walter M. Cook, *Assistant Cashier*

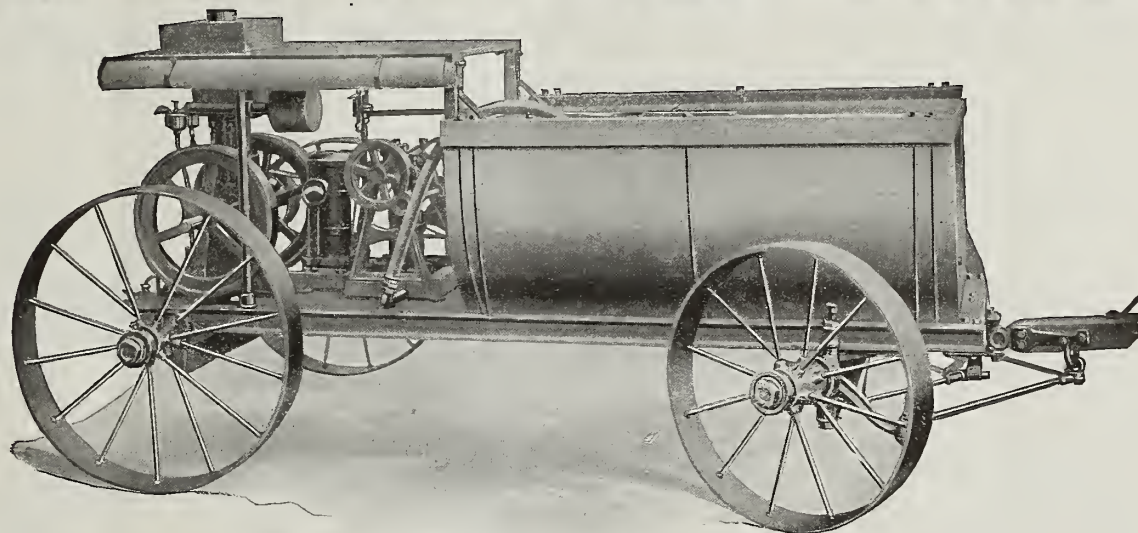
INTEREST PAID ON TIME DEPOSITS AND SAVINGS ACCOUNTS

Accounts of banks, firms, corporations and individuals solicited. Travelers' checks for sale, and drafts issued available in all countries of Europe.

Continual Efficient Spraying

IS BEST OBTAINED WITH

THE HARDIE POWER SPRAYERS



THE HARDIE HILLSIDE SPECIAL

This machine is built to successfully spray the difficult orchards where hills, rocks or adobe soil abound—where the others fall down

HARDIE FEATURES

SIMPLICITY OF CONSTRUCTION—Obtained by leaving out everything of a complicated or troublesome nature and using only such construction as experience has proven best.

STRENGTH—The liberal use of high grade steel and the use of metals which will stand the wear and tear of high pressure work.

BIG CAPACITY—Our pumps are properly designed and built by "sprayer specialists." We know the importance of lots of liquid at the nozzle and build accordingly.

HIGH PRESSURE—We use a powerful engine on our machines and our pumps are so light-running that high pressure can always be obtained.

LIGHTNESS—By the use of a high carbon pressed steel frame we get strength and long service.

FROST-PROOF ENGINE—We use the Ideal engine. It is compact, strongly built and reliable. Plenty of power and always ready to run.

PRESSURE REGULATOR—A simple, reliable device to control the pressure. There is no load on the engine when the stopcocks are shut off.

LITTLE THINGS—Stay—There hose ends which cannot be blown or pulled off. Angle cut-offs, a decided improvement over the old style stopcock. Hose, the kind that gives you the service you desire.

Whether your orchard is large or small there is a Hardie Sprayer to fill your requirements, assuring you spraying success, with a

Hardie Hillside Triplex
Hardie Western Triplex

Hardie Duplex
Hardie Junior

HARDIE HAND PUMPS—the world's best, so simple that the only tools required to keep them in perfect working order "are a boy and a monkey wrench."

There are now in use nearly 30,000 Hardie Hand and Power Sprayers. Our prices are lower than other machines of like specifications. Take advantage of our large output and the Spray Pump Value which you will receive, and

BUY A HARDIE

Write for our catalogue giving mechanical details of our full line.

The Hardie Manufacturing Co.

Hudson, Michigan

49 N. Front Street, Portland, Oregon

"Look Beyond the End of Your Nose"

grandfather used to say. A big Florida fruit grower remarked that he had to go to California to learn that he had been wrong for twenty years. So the potato growers of Maine get hints from Colorado; the apple men learn how to coöperate from the orange growers. Here's where the national-farm-weekly idea comes in. If you want to travel north, east, south, west and get your long-distance lessons in money-making methods without spending carfare, look beyond the end of your nose and get the national-farm-weekly habit, and the greatest of these is *The Country Gentleman*.



MORTGAGES ARE AS RARE AS PLUG HATS AND WRIST WATCHES in the Shenandoah Valley of Virginia. For here is the land of \$5,000,000 apple crops—one county shipped more apples last year than the whole state of Oregon; here is the land of pure-bred livestock and great yields of corn and alfalfa. Here is the land, too, that welcomes the settler and sells him orchard ground at prices within his means. One man sold his holdings in the Northwest for \$2000 an acre and became a Virginian for \$100 an acre. Great estates are being cut up, and there's a chance for you if you want it after reading *Along the Shenandoah Valley Pike*, in *The Country Gentleman*.



"WHY STAND YE HERE IDLE?" You have a right to ask that question of your loafing half-dozen acres that seem useless for the growing of staples. But how about the non-staples? The things that are not corn, wheat, meat, eggs, milk? The non-staples, by-products, side-lines (call them what you will) avoid competitive prices because the demand is greater than the supply. The arts and trades can't get enough, at fancy prices, of the things that your idle acres can grow. For months we have had experts at work on this by-product idea. The result is a series of articles that will make you want to grow something father and grandfather didn't grow; incidentally you will grow something else they may have neglected to grow—a bank balance. You will find this series in *The Country Gentleman*.



THE DOUBLE-PROFIT FARMER isn't resting on a one-legged stool. He is setting his crops to his livestock and marketing the stock with a chance to make a profit on both. He is growing apples and eggs, or berries and broilers, on the same land on the double-crop plan. He is selling direct and getting both the producer's and the retailer's profits. He is fitting two or three specialties together to get the insurance of diversified farming, and he is safeguarded against total failure because he has three legs to his stool. Double-profit combinations are the backbone of the small place and they are described in nearly every issue of *The Country Gentleman*.



TEN DOLLARS MINUS ONE DOLLAR FIFTY EQUALS WHAT? Service. One of our editors said the other day: "Here's a check for \$1.50 for a year's subscription accompanied by a technical question that will cost us ten dollars for an expert to answer. Where do we get off?" The answer was easy: We don't get off; we *get on*. And that's why we're getting on. Service. Our three hundred thousand weekly circulation from a little more than nothing two and a half years ago shows that we are getting on. It's service. Nearly three-score experts are at our call to answer any question, no matter how technical, you may ask us about your business of farming. Ask us! Thousands are doing it. Just write the R. F. D. Letter Box in care of *The Country Gentleman*.



Everything about the **BUSINESS** of farming you will find in **THE COUNTRY GENTLEMAN**, the national farm Weekly. Five cents the copy, of all newsdealers; \$1.50 the year, by mail.

THE CURTIS PUBLISHING COMPANY

Independence Square

Philadelphia, Penna.

BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Economical Orcharding

By Luke Powell, Prosser, Washington

THE question that confronts we fruitgrowers today is not so much how to raise good fruit,—we have practically solved that problem,—but how to raise it economically or, in other words, how to produce the best fruit at the lowest minimum cost. In one of Riley's poems entitled "When We All Went to the Fair," the hired man, telling of his experiences at the fair, says:

"There was a place there where you played,
and I played,
And then there was a place where you paid,
and I paid."

Now we fruitgrowers who came West to raise fruit, thinking it was a game where you played, have many of us reached that place where you pay, and we have paid. But most of us are men enough not to go to the mourner's bench over a little thing like this, but feeling that fruit growing was the profession we wanted to follow—and if there ever was a profession it is one—we have determined to profit by our past experience and make fruit growing a profitable business as well as one of pleasure. We are no longer ranching in the haphazard ways as of old. The word "luck," which used to be such an important factor in the success or failure of the rancher's crops, is now obsolete in that sense, and to succeed today in any phase of ranching we have to use both scientific and business methods. Especially is this true in fruit growing. Science and business must go hand in hand; they are, practically speaking, Siamese twins. If you neglect the one you injure the other, and if you try to separate them the results will be disastrous to the business.

But what is science in the orchard? Does it consist in our digging down and trying to find out why the San Jose scale prefers the fruit tree to the locust? or why the codling moth prefers the apple to the walnut? or how does alfalfa take the nitrogen out of the air? or why doesn't the seedling tree grow true to name? No, we haven't time for such trivial things, we have problems to solve and they are scientific ones, too. For instance, of the pests that injure our fruit and trees we have four of primary importance here, i. e., the aphids, the scale, the peach twig borer and the codling moth. Now if we as fruitgrowers are going to raise fruit successfully, we will have to eradicate these pests, or at least control them, and to do that we must know them—know their life history, their habits, their breeding times, their breeding places, their prolific qualities and their destructiveness, and in fact

be so familiar with them that we would recognize one if we met him coming down Broadway in New York City, and know just what to use and when to use it to kill him.

If every fruitgrower in the Yakima Valley had the proper knowledge of the scale, as to its prolific and spreading habits, in the spring of 1912, and had sprayed their trees with the knowledge and means that would have eradicated that pest, there would not have been such a large percentage of the fruit infected with scale the following fall. Again, suppose that in 1913 we

we fight it. You can put on as many inspectors as you have a mind to, and fine and imprison every rancher who fails to comply with the law, but carrying out the letter of the law will not conquer it; you have got to get the spirit of the law into the community and the individual of the community must remember that he is simply a unit of that community, or in other words a link in the chain, and not an independent individual as many of us think we are. Co-operation is a word that is very obnoxious to many of us because we like to fool ourselves into believing and feeling that we can live independent of our community interests. The vast blue-grass fields of Kentucky were much coveted by certain tribes of the American Indians and there was plenty of room there for all of them, but they couldn't co-operate so they proceeded to destroy each other and that beautiful land became known to the Indian as the "Dark and Bloody Ground." Now we are not quite as bad as the Indian, however some of his traits will bob up occasionally, and so long as we fail to organize a co-operative fight against the blight and other orchard pests just so long will these things flourish and our business be a failure.

Right here is where some of us are ready to throw up our hands and say: "Enough! I never did know anything about orchard pests and I couldn't learn if I wanted to; and that blight, if it gets in my orchard I am not going to fight it, I'll just chop the trees down and quit; and when it comes to co-operation you are not talking to me, there isn't anybody in this neighborhood I would co-operate with." Now, fellow fruitgrowers, if this is the way any of you feel, there is just one thing for you to do and that is get out of the fruit business as quickly as you can, but I am afraid you are going to have a pretty lonesome time on the outside, for even the I. W. W.'s and the hobos have an organization and co-operate. I believe that the average fruitgrower has just as good a brain and as good reasoning powers as any other average business man, and that he can just as easily master the problems and meet the requirements of his profession as any other successful man can.

How can this be done. One trouble with the average rancher is he spends too much time developing his muscle and not enough time developing his brain. In other words, he is too industrious and not lazy enough; or in still better terms, he values his physical

Features of this Issue

ECONOMICAL ORCHARDING

PRUNING: A QUESTION REQUIRING
A GREAT DEAL OF THOUGHT

FACTORS IN THE CONTROL OF
PEAR BLIGHT

SPRAYING TABLE FOR 1914-1915

HANDLING THE JONATHAN APPLE
AND PEARS

SOLUBLE SULPHUR

MARKETING OF FRUIT FROM THE
MERCHANT'S STANDPOINT

PRUNING AN APPLE ORCHARD

would have had the proper knowledge of the codling moth and had sprayed accordingly, that large per cent of wormy apples that showed up in the fall would have brought in dollars instead of being disposed of as culls or fed to the hogs. But we didn't know, or if we did know we didn't apply our knowledge, and the spraying we did cost us just as much as if we had used scientific business methods, and instead of having 99 per cent clean fruit and a profit a large majority of us had about 50 per cent wormy fruit and a loss on our year's work.

Again, take for instance the worst of all orchard diseases the "blight." If, when about three years ago it appeared in the Yakima Valley, every fruitgrower when he heard the report that it was in our midst, instead of turning a deaf ear to it, as many did, had sat down and began to make a thorough study of this dread disease and its ravages it would have been wiped out long before now and the ranchers of Yakima Valley would have been saved thousands of dollars. This blight will never be eradicated until we fruitgrowers know what we doing when

properties too high and his mental qualifications too low. We have fallen into this rut because we thought it was business on our part to work sixteen hours per day and mix a little reading and thinking and sleeping, mostly sleeping, in the other eight hours. That may be business, but it is the kind that is bankrupting most of us today.

There isn't any of us who knows all there is to know about fruit growing today or what it will be next year, but if we are going to succeed it is business on our part to keep ourselves keyed up to the situation in order to meet the many emergencies that are always coming up in horticultural, agricultural or any other kind of work. It is business and strictly business on our part to take a limited amount of the best literature on fruit growing, to attend so far as practical the horticultural meetings and visit other successful growers. However, if we take a few good magazines and we are too tired to read the articles in them, or haven't the inclination to do so, the money spent for this literature is a waste and instead of this business move being of economical value to us it is an economical waste. The same is true if we attend meetings or visit our neighbors. If we do not get some good out of the meetings or visits then our time and the other fellow's time is wasted. But on the other hand, if it is business on our part to take good reading matter, it is certainly very important business that we take the time and sit down and read the articles that will help us in our work. Analyze them and compare the other fellow's methods with your methods and his profits with your profits, and the same is true with attending meetings and visiting other growers. If I am not raising as good fruit as my neighbor and as economically as he does, then it is business on my part to take the time to locate the troubles and improve my methods. Suppose we use a few illustrations to bring out more forcibly these points. In performing my inspection work, I found that the ranchers differed very much as to the proper amount of arsenate of lead to be used to a tank of 200 gallons. The variation was from six to fourteen pounds per tank. Considering the price of lead to be about twelve cents per pound, it was costing some growers 72 cents per tank and others \$1.68 per tank, or a difference of 96 cents per tank for the arsenate of lead alone. Experience has taught us that the rancher who does a thorough job will get just as large per cent of clean fruit that used six pounds as the one who uses fourteen pounds per 200 gallons. Again, I found that the variation in the number of above mentioned tanks that were put on per day differed from six to fourteen tanks, or a difference of cost of about \$1.00 per tank. Now it does not always hold good, but the man who used the most poison at the greatest cost generally had a larger per cent of wormy fruit than the one who had made a study of the subject and combined his scientific

knowledge with business methods, thus doing his spraying at a minimum cost and in return getting a maximum percentage of clean fruit. Again we find ranchers using pruning tools the usefulness of which have passed, or efficiency is wanting, and it is costing them from \$1.00 to \$5.00 per acre more to do the work than if they were using the proper tools. But, one man says, I can't afford to discard these old tools, I know they are out of date and have been used for five or ten years, and besides it doesn't make any difference if it does take longer, I do the work myself and my time is not worth very much. Whenever any fruitgrower reaches the point that his time is of little value it is high time that he was figuring on retiring, because if he doesn't do it of his own will, the spice of life, competition will force retirement upon him. Poor horses, poor machinery, poor wagons and poor farm tools coupled together with poor management is sending many ranchers down the long avenue of bankruptcy.

Let us stop and reason a minute. When people buy our fruit they try to get it at the lowest possible price; then it behooves us to get our labor done at the lowest possible price. When our products go on the market they bring a price according to the supply and demand, and a wise consumer will make his purchases when the supply is great, the demand light and the price low. The wise rancher, then, who uses a great deal of labor knows that it is business on his part to use all the labor possible when it is cheapest. With the oversupply of labor that we have had this fall and winter and with weather conditions so favorable for outside work, every fruitgrower should have the majority of his winter work done and be cleaned up and ready for the spring work, and that at a minimum cost, because there is no question but what we have had cheap labor this fall and winter. A man said to me a few days ago "that ranching was the easiest work and paid the best in return of any calling there is today." How could a sane man say a thing like that? Well, he loved the work, and he knew just when a thing should be done, and how it should be done, and why it should be done, and consequently he always kept ahead of his work, got it done easily at a minimum cost, and when he sold his products found that the cost of production hadn't eaten up all the profits that was left after the railroads and commission men had taken out their tithes.

How do we know how much expense we can afford to go to raise a box of apples. When a manufacturer sells an article he has to know the cost of production or he won't know what price to sell it for in order to make a profit. Now that is just our fix. We don't know what price to ask for our fruit in order to make a fair profit, and when we do sell them we take what the other fellows give us without knowing whether it is a profit or loss. We are like a ship at sea without a compass. Did you ever see a successful business

run without a set of books being kept? It is business on our part to keep a set of books and thus know just what we are doing, and if we don't some of us may get through by trusting to Providence and luck, but most of us will be like the "fellow that came out the little end of the horn"; that is where we will come out. Suppose next fall Mr. Blank has five thousand boxes of apples. He has combined scientific and business methods and knows practically to the cent what it cost him to raise the fruit and put it on the market. We will say that it was 58 cents per box, and that he has an opportunity to dispose of his entire crop at 88 cents per box. He doesn't have to wait and see what his neighbor is going to get or what some other man may offer him, but a few minutes of figuring will prove to him that that price means 30 cents net per box to him, or \$1,500 clear on his crop. Again, suppose we belong to an organization that is our selling agent and turn our products over to it together with a statement showing the cost of production, our managers can quickly figure just what these products should bring us on the market in order to return us a fair profit; and instead of striking out blindly as they do now, trying to find a market where the supply is limited and the demand great in order to get the highest price possible for us, at a heavy over-head expense, with the chances of such a market being glutted when the products arrive, they would know at just what price to offer our fruit on the market and in the majority of instances having the market seeking it instead of it seeking a market. Not only would we be satisfied but the selling cost could be reduced to a minimum, and we as ranchers would be getting down to business.

There are thousands of acres of orchards coming into bearing and there are still more to follow. Competition is loudly knocking at our doors. Some of the illustrations and suggestions that have here been offered may be a little overdrawn, but if we are going to succeed there are two underlying facts that we cannot get away from, i. e., we must have a thorough, scientific and business knowledge of the profession and know how to use them. Those who have the faith, the hope, the nerve and the determination to meet the requirements of the business need have no fears as to the outcome, because in every country and on every inhabited island of the sea there are consumers for our products, and where there are consumers there is always a market.

The Bureau of Statistics, in co-operation with the Weather Bureau, United States Department of Agriculture, gave out the estimate for quantity and quality of apples in the United States as follows: Production: Oregon, 1913, 82 per cent; 1912, 100 per cent; for the United States, 1913, 44.6 per cent; 1912, 69.9 per cent. Quality: Oregon, 1913, 98 per cent; 1912, 96 per cent; for the United States, 1913, 70.2 per cent; 1912, 83 per cent.

Pruning—A Question Requiring A Great Deal of Thought

By Professor C. I. Lewis, Experiment Station, Corvallis, Oregon

I REALIZE that pruning is a rather dangerous subject to write upon, owing to the fact that it is almost impossible to do justice to the subject in a single article. It is only by having sufficient time and opportunity to handle the subject as a whole that one can really do it justice. I believe that the time is going to come when we shall have works on pruning that will be as extensive as the complete encyclopedia of horticulture is at the present time. Pruning is rapidly going to solve itself down to the study of individual varieties in their peculiar surroundings. As an example, the pruning that you would give a Jonathan on a light soil at an elevation of two thousand feet is radically different from that you would give a Yellow Newtown on a heavy soil at a low altitude. We have need to study the habits of trees, how these habits are influenced by surroundings, and how we can change certain habits of growth. We are just beginning to see a little daylight in pruning, but only very little. For nearly two centuries we have been marking time. The next decade, however, is going to see a great advance.

I want at this time to give a few thoughts that I believe will be of interest to fruit growers. First, as regards starting the tree. The height of head is a subject I do not care to discuss at this time, as I could not possibly do it justice. That is only a relative term and will vary with the variety and type of tree, and the region in which it is located; but I want to call your attention to the following point—I do not believe that fruit growers are giving enough attention to the proper spacing of the branches. This is especially true with apples, pears, and cherries. With peaches it is not so important; probably not so essential with prunes; but with the fruits I have named it is very important. The typical open-center tree that so many of us are growing leads us into bad habits. Unless we are careful we shall find that our branches will all come out at nearly the same point, and as the tree develops and grows we gradually are building up a very weak crotch. The further apart we can get our branches spaced, the better. In order to do this, I would suggest that more of us look into the possibilities of the modified leader type of tree. In this type we start the tree as though it were a leader, and allow it to remain as a leader for at least two years. Whether we shall remove the leader at that time, or whether we shall suppress it entirely, will depend upon circumstances. With pears I should remove it entirely. With most apples I should remove, while with others I should simply suppress it, so that it simply balances up with the rest of the tree. I have tried this

system of pruning in very extensive orchards, and I am very much pleased with it; in fact, I am satisfied in my own mind that it is giving a very strong tree. Some people say that this will be bad for pears on account of blight, but I do not feel so. While we do not want a leader tree with pears, since, if the blight gets in the leader it tends to run down and the tree may be lost; nevertheless, if we have a weak crotch, all the branches come together at one point and if it gets into the crotch the tree will be lost. The modified leader, I believe, gives a good tree to fight blight in and gives a strong tree.

A very common mistake that the average fruit grower makes in pruning his trees the first two years is that he prunes the weak branches the most and the strong branches the least, thinking that in this way he will strengthen his trees. He has read that the more you cut the more the reaction, but he has confused cutting the tree as a whole with the relation of the branches to each other. He must study pruning from the point of view of the relation of the buds and branches to each other, and not simply from the point of view of the whole tree. Let him just reverse his operations; strengthen the weak wood by suppressing the strong wood. If there are five scaffold branches, say, on a two year old tree, cut out the weakest branch the least, the next to the weakest more, and so on, cutting the strongest branch the most. This will tend to balance up the tree, and by paying attention to this for a series of years, the mistakes that have been made the first two or three years can be overcome. When you leave a large number of buds on a weak growth you make a stronger demand on the sap of the tree, and by reducing the buds on the strong growth you are going to give the weaker growth relatively more food, which means more development.

Another point I want to suggest is this: when you cut your sub-laterals on each one of these five scaffold branches, you are likely to cut them rather equal. As a result you get a perfect balance between every pair of branches on your tree. This perfect balance of the branches means weakness. It means that you have a series of crotches in which all the strain and weight of the tree comes at the crotch and the pull is equal. Now, instead of doing this, handle each branch on your tree as a leader or in just the way you would handle the leader tree—that is, each year choose one part of the branch which is going to continue the growth. Do not suppress that quite as much as you do those branches on the side. If you do this you will build up a strong lever

and with the numerous lateral branches pulling at various points you will have much less breakage and a tree that is capable of handling a heavier crop. Many a man prunes his trees well the first three or four years, but the following three years he is likely to make many mistakes. Beginning with the fourth year, in my estimation, the tree is reaching the critical time in its development. This critical time may extend from the fourth up to the eighth year, for it is up to that time that the trees come into bearing. If you pursue the system of pruning that you have followed in the past you may have trouble in bringing your trees into bearing. I know of orchards in the state twelve or fifteen years old that have never borne a profitable crop, and this condition is due almost entirely to wrong pruning. If your trees have made a big, strong growth for the four years, you are ready to begin to encourage fruit. You won't have to encourage fruit on such varieties as the Jonathan, Wagner, Winesap; but you will have to encourage bearing on the Yellow Newtown, King of Tompkins County, Gravenstein, and many others I could name. Instead of following the vigorous method of pruning that you have in the past—that is, taking out nearly all the lateral growth and simply leaving terminal growth—I would suggest that you begin to let up on the pruning. There is a choice of several things for you. One way to do would be simply to suppress the terminals so that they will not run away with the tree. Then take out just a moderate amount of the lateral growth. If you find in May or June that you have left a little too much growth, take it out at that time. I am really inclined to believe that we take out too much lateral wood from our trees even the first two years. We keep chopping out the laterals, force all the growth into terminals, and then sigh because we get the results that we have brought about by our own pruning.

Take another case: if your terminal growth is not at all rank and you feel that the lateral growth is a little too thick,—why, let your terminal growth go on; at least give it but moderate heading back, and thin out your lateral growth somewhat. Just which practice is the best to follow in all cases no one can say. Each individual case must be studied.

I want to take up another case. Your trees are from eight to fifteen years old and are not bearing. Of course, frost, or pollination may be at the bottom of it, but in many cases it is a matter of over-stimulation. I would let up on the pruning of such trees; in fact, I am inclined to believe that I would not do any for a year. I would cease the active tillage, and

if my trees were very vigorous and strong, I incline to believe, that I would sow the orchard down to wheat or rye or oats for one season. You need not be afraid of killing your trees. It will tend to check them and check produces fruit. Of course, you could bind the trees with wires, you could root-prune them, you could strip out pieces of bark; but I believe that the checking by little or no pruning, no tillage, or the substitution of a cereal crop for a year will in many cases correct the trouble. After the trees come into bearing you can thin out the wood without disastrous after-effects.

Just a few thoughts to the walnut men: I am interested in twenty-two and one-half acres of walnuts four years old. I have pruned them about the same as though they were apple trees and I am very well pleased with the results. I headed the trees about

thirty inches, formed from four to five scaffold branches, drove a good stake in the ground, and tied the scaffold branches for the first two or three years to that stake; I cut back the terminal growth each year so as to force out lateral growth; as a result, I have a splendid, broad-spreading, strong, stalwart tree. Some other time I may give you more details on this pruning. Likewise, I have pruned cherries now for four years and I am handling them very much the same as I am handling apples; and I have kept them down close to the ground, and have stocky trees, well balanced. Last July I summer-pruned them with the result that this spring I shall have to give them practically no pruning.

Just one more thought before closing. If you have been a member of that class of pruners who love to dehorn pear trees,—why, resign at once. Every year I see hundreds of pear

trees that have been let go until they get a little rangy and then have been pruned very severely. That is a mistake. It simply forces out a tremendous soft sappy growth, and when that gets into bearing it will be very high from the ground. Instead of this dehorning, thin out the weak spurs. Throw the strength of your tree into a less number of spurs and direct that growth which would go into vigorous sprouts into every spur on the tree. The result will be renewed vigor of the entire tree, and larger, better fruit. The same practice also applies to Italian prunes.

I realize that in this article I have only hit a few of the high places, and perhaps they do not seem to fit into your conditions; but, as stated in the introduction, it is almost impossible to write a short article on pruning that is clear and will cover all cases.

Factors in the Control of Pear Blight

By P. J. O'Gara, Pathologist, Medford, Oregon

DURING the season of 1913 pear blight was more severe in many districts on the Pacific Coast than it had been for several years previous. In many sections the infection was such as to cause a great deal of loss, and generally the disease was in the form of a severe epidemic. The question is often asked, "Why do we have epidemics of pear blight?" This question is no more difficult to answer than the question "Why do we have enormous yields of fruit or harvests of grain?" The answer to the question as to why we have more bountiful crops one year than another is usually given by the average man in a single sentence, "The conditions were more favorable." In other words, the reason why we have occasional phenomenal yields is because the conditions for plant growth were unusually good. For our heavy crop of wheat we sowed the seed at the right time and in the proper amount, the soil had been previously well prepared, climatic conditions during the entire season were favorable, and, more than likely, we used good judgment in taking advantage of nature. It must be remembered that the pear-blight germ is a plant which depends upon favorable conditions for its best development; it must be "planted" on the right soils and the conditions for its maximum growth must be favorable, as in the case of the wheat plant. While it is known that disease-producing bacteria may be more virulent at one time than another, just as seeds may be more or less viable, nevertheless the conditions for a disease-producing organism's development must be favorable or it will not develop so as to cause what is called an "epidemic." After all, an epidemic of pear blight may be compared with an "epidemic of good wheat crops."

It must be remembered that a plant will not make its best growth where

conditions are below normal. Change these conditions for the better and maximum growth or development of the plant is the result. Those who have lived in the arid Middle West have probably noted that if the dry prairie is broken up and allowed to lie without cultivation the following season a magnificent crop of sunflowers will be the result. Where did these sunflowers come from? They certainly were not carried there by birds or wind in the amount necessary to produce such a heavy crop. The sunflower plants were there before the land was plowed, but no one but a botanist would have known them to be sunflowers. Instead of being the rather tall, yellow-flowered plants which everyone knows, they were merely minute, few-leaved specimens, and instead of bearing the large golden-yellow flowers, these dwarfed sunflower plants produced but a single flower, each having but one small ray and but a single seed. However, when the land was broken the conditions for plant growth were improved and the seeds from the dwarfed sunflower plants instead of producing dwarfs produced vigorous plants. The "epidemic" of sunflowers was produced simply by making conditions favorable. The seed was planted deeper and soil moisture was conserved. This example of what the sunflower will do under various conditions will illustrate the point I wish to make, namely, that the pear-blight germ, being a plant, must be influenced by environment and change of conditions.

Cause of Serious Infection.—In order to have a serious pear-blight epidemic the following conditions are necessary: (1) The germ must be present; (2) insect or other agencies for the "sowing" or spread of the blight organism must be plentiful and active; (3) conditions for the best development of the germ after it has been "planted" must be favorable. It is easily seen that there

can be no infection if the blight germ is not present, and, furthermore, there can be no epidemic even though the blight germ be present providing the other factors are wanting. Those who have had experience with pear blight know that it will attack all species of the pome family, and that any part of the tree may become infected,—blossom, twig, limb, body, crown or root. Such expressions as "blossom blight," "twig blight," "body blight," "collar-rot phase," "root blight," "fire blight," etc., are all in a measure misleading, as fruitgrowers are often mistaken in thinking that these terms indicate a different disease in each case. The term "fire blight" is not good for the reason that fire-searced trees do not resemble trees badly blighted by the light germ. Furthermore, serious infection which may result in the death of the tree may not show any indication of the so-called "fire blight." This is true in serious crown and root infection. The term "collar-rot phase" is a notably bad one, simply because the germ does not produce a rot. The germ causing pear blight does not belong to the rot-producing group of plant parasites. Even the term "pear blight" is not a good one; it would be best to make use of the term "pome blight," or better, "bacterial pome blight." There are certain other diseases of pome fruits which often produce effects somewhat resembling the bacterial blight, and therefore it would be much better in speaking of blight to qualify it. If we would use the term "bacterial blight" in the case of pears, apples, quinces and other pome fruits we would not fall into error.

As stated above, in order to have a general infection, or for that matter any infection, the blight germ must be present. It has been demonstrated that this germ will live during the dormant season of the tree in the cankers formed by the previous year's infection

of limbs, bodies or roots of pome trees. No part of a pome fruit tree may be free from infection. The germ is carried from these centers called "holdovers" by various agencies, principally insects. However, birds and other animals, even man himself, may be distributing agents. For a good many years, besides having charge of eradication work, the writer has done much investigation work in determining the relation of various carriers of infection to blight epidemics. A very large number of species of insects and their near relatives have been studied. Not only flying insects have been found to be effective in spreading infection, but also many insects and insect-like species which do not depend upon flight have been found particularly dangerous. In this short article we cannot discuss the various insect agencies; however it is enough to say that insects and their near relatives are the most important factors in the distribution of the germ of blight.

Upon the control of blight, therefore, depends in a great measure the control of insects. However, in the first place all sources of infection, namely, the holdover cankers, should be carefully eradicated. This is a difficult thing to do, for the reason that the most careful worker will often miss holdover blight. We know that there are varieties of pome fruits which are very susceptible to the disease; others that are quite resistant. We often hear of varieties being "immune," but, so far, no species of the pome family has been found immune to blight. There are various degrees of resistance, and that is about all that can be said. Very often the attention of the fruitgrower is directed away from resistant varieties by the statement that they are so resistant that blight will not hold over in them. However, every fruitgrower knows that our cultivated varieties are not growing on their own roots. For instance, a Bartlett pear is not all Bartlett; a Newtown apple is not all Newtown, and so on. Until recently no attention was paid by the nurserymen to blight-resistant stock upon which to work our commercial varieties. In the main, our commercial varieties of pears are all worked on French stock which is very susceptible to blight. Our apples are also worked on seedling stock which is never selected for resistance. From this it can be readily seen that, although the variety top-worked on the stock may be quite resistant, the stock or root being very susceptible renders the tree unsafe. It is often said that a chain is no stronger than its weakest link, and, in the same way, a variety is no more resistant than its least resistant part. If the root system is very susceptible, the tree may be lost although apparently there may have been no infection noted above the ground. I have seen the worst cases of blossom and twig infection in very resistant varieties where not a single holdover could be found in the orchard itself, or in the immediate vicinity, so far as the examination of the parts above the ground was concerned. How-

ever, by noting the infection centers, examination of the crowns and roots below the ground showed the presence of holdover blight in certain trees.

In the case of Newtowns, which are quite resistant under average conditions, I have found the most serious holdovers in the roots (stock). Here, then, is an important factor in the control of blight. Not only should the part above the ground be examined, but the crown and roots of a tree should be bared so as to be sure that no holdover exists there. There is no mystery about crown and root infection; certain insect agencies work as readily under ground as they do above. Furthermore, in cases of severe blossom, twig or limb infection, infection may be carried down to the roots from above by rain. I have been able to demonstrate the presence of blight germs in droplets of rainwater trickling down the trunks of trees.

For many years I have advised the use of sticky bands in the control of insects which are known as blight carriers. In this connection it may be said that watersprouts are not necessarily the only entrance points for root infection. Of course many root infections may be traced directly to infected watersprouts coming from the crown and roots, but many infections are brought about by direct crown and root infection. The entrance directly into the crown and root is usually effected through growth cracks and by means of punctures made by eating, boring and sucking insects carrying the germs. Such insects may be caught by the use of sticky bands. Aphides should also be kept under good control, as they are notable carriers of infection to the succulent growths.

Tree medication has always been a favorite hobby with many people. Theoretically, there may be some basis for work of this kind, but the practice of controlling blight by the use of the hypodermic needle has proven unsatisfactory. In my investigation work covering a long period of years, I have used all sorts of chemicals and chemical combinations both externally and hypodermically, but so far no promising results have been forthcoming. It is said that a drowning man will grasp at a straw; we have grasped at everything, whether it showed promise or not. The work of pear-blight control must depend, at least for the present, upon the methods which have been worked out, namely, careful eradication of holdover blight, thorough disinfection, and last, but not least, the control of insect agencies. Of course, certain insects, such as bees, are necessary for pollination, but the time over which they work is very short as compared with the growing season following the blossoming period, and during which period the most serious infections are produced. During the growing season, blight should be removed whenever it appears; any living infection should always be considered a center for further spread of infection.

In future planting we should demand at least resistant roots for our commer-

cial varieties of apples and pears. Already many nurserymen are growing commercial varieties worked on resistant roots, and many have even gone so far as to grow resistant varieties for top-working. The control of blight is not so difficult when the framework, body and roots are all resistant to blight to the extent that holdovers will rarely occur in them. The development of commercial varieties equal to our well-known varieties and at the same time resistant to blight is an ideal we have been striving toward for many years. Many European-Oriental hybrids of considerable resistance have been produced, but their quality does not compare with our well-known commercial varieties. Breeding and selection will in time solve the question of blight control, but for the present we must adopt the best practice known to save the pear and apple orchards now growing. Experimentation should go on, but in a dangerously infectious disease, such as pear blight is, all experimentation should be taken out of the hands of the amateur. Much of our trouble in the control of this infectious disease is due to a desire to experiment on the part of those wholly unfit for work of this kind. The man who knows nothing about bacteriology would hardly consider himself safe in experimenting with the anthrax germ; neither should he consider himself capable of experimenting with the pear-blight germ.

Fall Plowing

The question is often asked whether it is best to plow the orchard in the fall; whether such practice is permissible. Under average conditions we would say no, that late spring plowing is apt to be the best time for the grower to plow most orchards in this state. There are some exceptions. For instance, in semi-arid regions where the rainfall is light, plowing in the fall leaves the ground rough and it may catch more moisture than if the ground is left hard and smooth. Again, one is sometimes justified in practicing some fall plowing where the orchard is very large and it has been found by past experience impossible to secure horses enough to plow it in the spring at the proper time. In all regions with ample rainfall late spring plowing is to be preferred, as under such conditions fall or early winter plowing generally means a leaching out of plant food and a loss which is unnecessary. Again, fall plowing destroys all growth of cover crops, weeds and grass which in the spring can be plowed under, and will thus give a splendid supply of organic matter which, when decayed, will form humus and give us a supply of nitrogen. It has often been found with heavy clay loams in regions of the state subject to heavy rains that fall plowing is often just about so much labor lost. The soil has run together and compacted even more than those portions which were not touched.

The Washington State Agricultural Experiment Station Spraying Calendar for 1914

Pests and Diseases of the Apple, Pear, Peach, Plum, Cherry, Etc.

(POPULAR BULLETIN NO. 59)

Prepared by JOHN G. HALL, Plant Pathologist, and M. A. YOTHERS, Assistant Entomologist.

There is no spraying that will kill everything. Use the ones that fit your case. For information about insects, pests, plant diseases and spraying, write to the Washington Experiment Station, Pullman, Washington

AFFECTING THE ROOTS—

NAME	DESCRIPTION	TREATMENT
1. Woolly aphids.....	Small galls containing mealy insects.....	Expose roots and wet with 1% potassium cyanide solution or tobacco.
2. Grubs and wireworms.....	Feeding on the roots.....	No available treatment. Seek out and destroy insects.
3. Gophers.....	Feeding on the roots.....	Trap; or poison with raisins containing strychnine placed in runways.
4. Hairy-root.....	Excessive development of fine roots from a large root.....	No remedy except careful nursery inspection. Do not plant affected stock.
5. Crown gall.....	Smooth to warty swelling of various sizes.....	No remedy except careful nursery inspection. Do not plant affected stock.
6. Crown-rot.....	Dead, sunken bark at crown of tree.....	Avoid forcing the growth of young trees.

AFFECTING THE CROWN OR TRUNK—

7. Rabbits and field mice.....	Gnawing bark in winter.....	Keep trunk coated throughout winter with thick whitewash containing strong lime-sulphur.
8. Borers.....	Tunneling beneath bark or into heartwood.....	Keep trunk coated throughout summer with thick whitewash containing strong lime-sulphur.
9. Canker.....	Irregular, discolored sunken areas usually cracked around edges.....	No remedy when these cankers are due to winter injury. If black-spot canker, November spraying with Bordeaux (6-6-50).
10. Black-heart.....	Heartwood dead and stained blackish brown.....	No remedy known.

AFFECTING THE BRANCHES AND TWIGS—

11. San Jose Scale.....	Ash-gray or black, round scales, pinhead in size.....	Crude oil emulsion spray or lime-sulphur about March 1.
12. Oyster-shell bark-louse.....	Slender bark-colored scales filled with eggs, which hatch about June 1 (one brood a year)	1. Tobacco when young are hatching (about June 1). 2. Lime-sulphur (3°), or crude oil emulsion spray, in fall or early spring.
13. Woolly aphids.....	Clusters of mealy lice, often near injured bark.....	Tobacco spray.
14. Orchard mite eggs.....	Microscopic salmon-red spherical eggs.....	Crude oil emulsion.
15. Aphid eggs.....	Minute oval jet-black eggs (winter).....	Crude oil emulsion, or lime-sulphur (3°) before buds swell, or tobacco when plant-lice hatch.
16. Tent caterpillar eggs.....	Frothy mass encircling a twig.....	Crude oil emulsion before buds swell, or arsenical when caterpillars hatch.
17. Lecanium.....	Hemispherical brown scales.....	Crude oil emulsion before buds swell, or tobacco when scales hatch.
18. Cottony scale.....	Brown scales that develop cottony mass in fall.....	Crude oil emulsion.
19. Cicada and tree cricket.....	Twigs slit to contain eggs.....	Prune off infested twigs before eggs hatch.
20. Bark beetle.....	Tunneling under bark.....	Not likely to attack vigorous trees. No immediate treatment.
21. Lichens.....	Popularly known as moss.....	Winter spray with lime-sulphur (3°).
22. Gummosis of cherry.....	Glistening mass of amber-colored gum upon branches.....	Caused by scale, bacteria, aphids, over-irrigation, etc. Remedy depends on cause.
23. Fire-blight of pear and apple.....	Dead leaves and fruit hanging to blighted branches; blackish, water-soaked cankers.....	Prune away dead and blighting branches and wash pruned surfaces with 1 part of corrosive sublimate to 1000 parts of water. See Popular Bulletin No. 56.
24. Winter-kill or die-back.....	Death of twigs or branches from tip downward.....	No remedy. Remove dead wood. Avoid late irrigation.
25. Peach blight.....	Spotting of green twigs and formation of a gum.....	Prune out dead twigs. Spray in winter with oil emulsion.

AFFECTING THE BUDS, NEW LEAVES OR BLOSSOMS—

26. Bud-weevils.....	Hard-shelled beetles that drop when disturbed.....	Use inverted cone tree-protector of stiff paper or tin.
27. Cut-worms.....	Work at night; live in ground during day.....	Coat tree with Bordeaux. Scatter poison mash on ground near tree.
28. Ants.....	Eating buds, young leaves and blossoms.....	Pour 1% potassium cyanide solution in nest (deadly poison).
29. Budworm; twig-borer.....	Working in terminal growth furling leaves.....	1. Crude oil emulsion, or lime-sulphur (3°), before buds swell. 2. Arsenate lead when injury noticed.
30. Snapping beetle.....	Feeding in the blossoms.....	No treatment.
31. Chafer beetle.....	Eating through the blossoms.....	No treatment.
32. Salmon-fly.....	Feeding in the blossoms.....	Spray with arsenate of lead.
33. Thrips.....	Minute, active, slender insects.....	Tobacco.

AFFECTING THE FOLIAGE—

34. Tent caterpillars.....	Working from Web-nests.....	Spray as soon as caterpillars appear with arsenite of zinc, or burn with torch.
35. Tussock moth.....	Caterpillars covered with bunches of hairs.....	Spray as soon as caterpillars appear with arsenite of zinc.
36. Red-hump caterpillar.....	Striped caterpillars with red head and collar.....	Spray as soon as caterpillars appear with arsenite of zinc.
37. Grasshopper.....	Spray with Bordeaux. Scatter poison mash about orchard.
38. Climbing cutworm.....	See No. 27.
39. Pear and cherry slug.....	Slimy caterpillars feeding on surface of leaves.....	Spray with arsenate of lead; or dust with lime, ashes, or road dust.
40. Black aphid.....	On cherry.....	Spray early with tobacco, before leaves curl.
41. Green aphids—Pink aphids.....	Tobacco (summer), or lime-sulphur (3°), or crude oil emulsion in winter. See No. 15.
42. Blister-mite.....	Red, brown to black spots; on pear.....	No summer treatment. Crude oil emulsion or lime-sulphur when dormant.
43. Leaf hopper—Tingis.....	Sucking insects producing yellow spots in leaves.....	Tobacco spray. Use high pressure and disk nozzle to form mist.
44. Orchard mite.....	Causing leaves to yellow.....	Tobacco when noticed. See No. 14.
45. Peach leaf-curl.....	Leaves puckered, becoming rose-colored or purple.....	Spray in winter and early spring before leaves appear; use lime-sulphur.
46. Powdery mildew.....	Whitish patches on leaves, twigs and fruit.....	Spray with self-boiled lime-sulphur.
47. Rosette.....	Cessation of twig growth and rosetting of leaves.....	No remedy known.
48. Shot-hole diseases.....	Brown spots on leaves, later falling out.....	Spray with lime-sulphur during dormant season.

AFFECTING THE FRUIT—

I. Infesting Outside of Fruit:		
49. San Jose scale.....	Usually surrounded by red ring.....	No summer treatment. See No. 11.
50. Oyster-shell scale.....	Shaped like miniature mussel-shell.....	Tobacco when young hatch (about June 1).
51. Caterpillars.....	Several species may nibble on skin.....	Arsenate of lead as soon as injury is noted.
52. Apple scab.....	Dull greenish-black patches on leaves and fruit.....	Spray with Bordeaux (4-4-50) just before blossoms open; lime-sulphur (1.5°) after petals fall, and repeat after 10 or 14 days. Destroy all fallen leaves.
53. Brown rot of prunes.....	Small circular brown spots, later giving rise to spore-tufts.....	Destroy all mummified fruits; spray with lime-sulphur in summer.
54. Fruit spot of apricot.....	Brown, hard sunken spots or elevations.....	No remedy known.
55. Baldwin speck; fruit spot.....	Skin spots appearing before harvest, working into fruit.....	No sure remedy known.
II. Infesting Inside of Fruit:		
56. Codling-worm.....	The common worm in apple or pear.....	Spray with arsenate of lead, 1 lb. to 50 gals. of water, using Bordeaux nozzle with crook. Spray with force from a raised platform into every flower. Repeat immediately. If so applied, these sprayings are often sufficient. Keep a few trees banded. If many worms are trapped, spray about two to six weeks after first application.
57. Peach-worm.....	Same insect as twig borer.....	No satisfactory summer treatment. See 29.
58. Apple saw-fly.....	Green caterpillar mining in fruit.....	No known treatment.
59. Water core.....	Do not leave too long on trees.

Spraying Calender—Cont'd.

HOW TO SPRAY—Spray thoroughly. Direct your attention to the hardest places to reach. Cover every surface. Wet behind the buds. Reach the bottom of every crack. Fill the lower calyx cup. Do not try to economize on spray. For all orchard spraying use a high pressure pump (at least 200 lbs.) Use Bordeaux nozzles only. Use an 8-ft. spray rod. Have a crook to set the nozzle at an angle of forty-five degrees. Spray from a tower if the trees are beyond your reach. Write for bulletin on spraying.

LIME-SULPHUR

Fresh stone lime.....½ pound
Sulphur.....1 pound
Water.....½ gallon
Slake the lime in the cooker. Add the sulphur and the water. Boil briskly till the sulphur is dissolved (about 45 minutes), stirring continuously and keeping the cooker covered. As it boils down keep adding water. When finished let settle. Use only the clear liquid, which may be stored if kept from the air. Prepared in this way lime-sulphur should have a hydrometer reading of about 26 degrees, but little weaker than the factory-made product. Write for bulletin on lime-sulphur—Popular Bulletin No. 28.
For use, any concentrated lime-sulphur may be diluted according to the following table:

Hydrometer test of concentrate		To make dilute spray	
Beaume Degrees	Specific Gravity	Beaume, 3° Sp. gr. 1.02 1 lb. sulphur in 5 gal. Winter spray	Beaume, 1.5° Sp. gr. 1.01 1 lb. sulphur in 10 gal. Summer spray
34	1.302	1 to 14 water	1 to 28
32	1.279	13	26
30	1.259	12	24
28	1.236	11	22
26	1.215	10	20
24	1.196	9	18
20	1.158	7	14
16	1.122	6	11

OIL SPRAY

Crude oil emulsion for winter spraying:
Fish-oil soap.....20 pounds
(Dissolved in 20 gal. hot water)
Lye.....4 pounds
(Dissolve in 2 gal. water)
Mix, add water to make 177 gal., run agitator at full speed, and add
crude oil.....20 gallons
When emulsified, do not add anything else to the spray-liquid, or free oil will separate.

TOBACCO

Blackleaf 40.....12½ pounds
Fish-oil soap.....35 pounds
Water.....1000 gallons
Dissolve the soap in hot water. Blackleaf (old style) is one-tenth as strong.
For orchard mites or scab add 36 gallons of 32-degree lime-sulphur.

FINEST ORCHARD IN NORTHWEST

104 Acres near Spokane at head of Palouse Valley

70 acres in commercial apple orchard, trees are well fruited and will probably yield 12,000 boxes this year; 34 acres grain and alfalfa. Situated about 30 miles southeast of Spokane, on fine automobile road. Spokane, & Inland Electric R. R. station and siding on farm. Fine residence of eight rooms and bath. Foreman's house of five rooms, furnished. Windmill and tank, with jack attachment for engine. Water piped to house and barn, lawn, shrubbery and flowers. All kinds of berries and small fruits. Combination barn and packing house 40x80, bunk house, ice house, granaries. Large list of valuable personal property, including stock, vehicles, machinery, tools, hay and grain for six months. If you are looking for a beautiful home, with a good income, in a healthful climate, call at our office and let us show you photographs and tell you about it. Price, \$50,000. Terms, \$20,000 cash, balance on time at 6 per cent. Would consider Portland property in exchange.

Goddard & Wiedrick
243 Stark St., Portland, Ore.

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

BORDEAUX.

Bluestone 6 pounds
Good lime 6 pounds
Water 50 gallons
Dissolve the bluestone by suspending it in a sack in 25 gallons of water in a barrel. Slake the lime in another vessel, adding a little water slowly, and dilute to 25 gallons. Mix the two thoroughly. Even the best Bordeaux may scorch in rainy weather.

POISON MASH

Bran or flour.....25 parts
Paris green or zinc arsenite.....1 part
Mix dry, add water to form a stiff mash and season with stale beer or molasses. In case of serious infestation double amount of poison.

ARSENATE OF LEAD

Arsenate of lead (poison).....1 pound
Water.....50 gallons
For newly hatched insects it is not necessary to use it stronger. For old or large insects use double the quantity. Mix the paste well with a small amount of water. Powdered arsenate of lead is about twice as strong as the paste. Do not use arsenate that settles quickly or feels gritty. Agitate while spraying.

Arsenite of zinc powder is about four times as strong as paste lead. It may scorch in a damp season.

SPRAYING PROGRAM FOR THE MORE USUAL SPRAYINGS

- Before buds begin to swell
Crude oil emulsion or lime sulphur (3°) for scales and insect eggs.
- When new foliage is first appearing
Tobacco
For aphids, orchard mites, thrips, leaf-hoppers.
With arsenate of lead added
For budworm, twig-borer.
- When flower clusters are ready to open
With Bordeaux (4-4-50)
For apple and pear scab
Lime-sulphur (1.5°) with tobacco added
For orchard mites, thrips, aphids
- When last petals are falling
Arsenate of lead, 1 lb. to 50 gal.
For codling moth.
- In November (for Western Washington)
Bordeaux (6-6-50)
For black-spot canker and general clean-up.

Selection of Seed Potatoes

The present prices of potatoes indicate that seed potatoes will bring good prices before planting time next spring. The high price will form an inducement for growers and dealers in seed potatoes to be slack in their grading and selection of stock. This work is not carried on with any particular care like the selection of seed for many other crops, and usually the only selection that is made is to select good fields, and when the crop is dug the potatoes too small to be of marketable value for domestic use, as well as the largest and most irregular in form, are thrown out and all the remainder used. In this manner practically the entire crop is used for seed, and the selection of seed is a process eliminating the worst instead of a selection of the best.

Seed potatoes should be selected in the fall when the crop is being dug. If the crop is dug by hand the best hills should be selected as they are reached in the regular progress of the work. If the crop is dug by machines the best method is to select and dig by hand enough of the best hills to plant a breeding or seed supply patch each year. Enough hills should be selected by this process to permit of rejecting about half and leaving sufficient for the supply. If potatoes are grown as a regular crop each year the hills selection will be the best to follow.

The best hills are those that produce the largest yield of the best potatoes on a given area with a certain number of

plants in each hill. Such hills are quite uniformly indicated by the largest and best developed plants. Sometimes the largest plants are very late and do not have time to mature, and the result is a large number of small or medium size immature tubers. Maturity of plant is as important as size; either of which can be used independent of the other as a basis of seed selection. The largest yield should be by weight, but this character must be measured jointly with the term "best potatoes." The best potatoes are those that are of good uniform size, shape and color, and true to the variety in all these features. The most desirable hill produces a large yield of medium to large tubers of good shape and color. The best hills often have one or two potatoes that are too small for commercial use. If these are as large as one and three-quarters inches in diameter they make good seed if planted without being cut. The gathering and planting of the small potatoes cannot be advocated generally, because of the large amount of immature and poor material that would be used.

I have four inventions I want sold to farmers in your locality. Get agency.

CHAS. PETERSON, Inventor,
139 N. 14th St. CORVALLIS, OREGON

FOR SALE One of the best five-year-old walnut and peach orchards in Oregon. 25 acres, rich bottom land, close to a thriving, progressive town in the heart of Willamette Valley. Best of references. Sold in tracts to suit the buyer. Address H. C., care "Better Fruit."

For Sale, Orchard Land

Will sell one of my two 40-acre tracts of unimproved fruit land in the White Salmon, non-irrigated, district. All good and no waste land. As an investment cannot be equalled. For further information address the owner, P. O. Box 35, White Salmon, Wash.

Fruit Farms in Delaware

Are so close to the big markets that each individual grower can sell his own fruit and take advantage of the highest prices paid for fancy fruit. For information address The State Board of Agriculture, Dover, Delaware.

Hood River Grown Nursery Stock for Season 1913-1914

Standard Varieties
Prices Right and Stock First Class
C. D. THOMPSON, Hood River, Oregon

A Large Fruit Crop

is predicted for 1914. Low cost of producing and gathering your crop should be looked after. Our 1914 Catalog shows many labor saving devices. Write
The Fruit Growers' Supply Co.
Spokane, Washington

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The question is:

not "How little can I pay for roofing?";

but "How little will it cost me?"

You may pay little and get roofing that soon cracks, crumbles, and leaks; but it *costs less* in the end to use roofing of natural asphalt, which stays waterproof.

Genasco

THE TRINIDAD-LAKE-ASPHALT

Ready Roofing

has the natural oils of Trinidad Lake asphalt sealed in it. They give Genasco life and vigor to resist sun, rain, wind, heat, cold, alkalis, and acids.

It stays weather-proof and saves repair-expense.

Get Genasco and you get the satisfactory answer to your roofing question. The Good Roof Guide Book and samples are free on request. Ask your dealer for Genasco—smooth or mineral surface; several weights. Look for the trademark. THE KANT-LEAK KLEET waterproofs seams without cement and prevents nail-leaks.

The Barber Asphalt Paving Company

Largest producers in the world of asphalt and ready roofing.

Philadelphia

New York Chicago
San Francisco



Handling the Jonathan Apple and Pears

By Professor C. I. Lewis, Oregon Agricultural College, Corvallis, Oregon

EVERY fall my attention is called to a peculiar condition which attacks the Jonathan apple, and many specimens of the Jonathan apple are sent into the Experiment Station which appear fine on the outside, but later examination shows that they are worthless on the inside. These apples are generally somewhat punky and dry and the flesh, especially around the core, is discolored by brown patches, which later often develop into a soft rot. This is sometimes called a core rot, but it is an entirely different condition and caused probably by different surroundings than that which causes the typical dry rot, or core rot, which is a term many of our orchardists use. The soft condition of the Jonathan apple is due entirely to the method of handling them. In almost every case such apples have hung on the tree too long. Again, if after they have been picked they are

allowed to become heated or delayed before they are packed or before they are shipped, they will often break down in a similar way.

There is but very little question in my mind but that we are fast approaching the time when the Jonathan apple will be handled like summer perishable fruit. We will have to take up the question of packing these apples very carefully indeed. It is doubtful if we will be able to pick all the fruit from a Jonathan apple tree with one picking. If we do this we will probably wait too long, as in our desire to secure color we will allow many of these apples to become too ripe and will experience the physiological breakdowns that I have mentioned. It is only by picking them at the proper time and rushing them into the boxes and getting them right into the cold storage house or refrigerator car that we can get the

best results on this variety. There is more trouble being reported to me from Jonathan apples than from all other varieties of apples in the Northwest combined. I am having specimens sent to me constantly.

Another trouble attacking the Jonathan is the light spots often appearing like a scald, the spots being of a light tan color, and the apple looking much as though they had the smallpox. That has generally been due to faulty handling, generally in transportation and storage. They have been allowed to become heated. Occasionally they are rotted or broken down quite badly around the calyx or eye end, the tissue of the apple in that region being discolored and soft. The tissue on the outside is generally in worse condition than on the inside of the apple. This is almost invariably an indication that the apples have been frozen in transit or have been brought out of a frozen condition and thawed very rapidly. This is generally due to carelessness in handling in transit, or on the part of the receiver rather than on the part of the grower.

Horticulturist seeks position as farm or orchard superintendent. College training and life time experience in all branches. Married. Reference. Distance no objection.

F. W. SABRANSKY,
Route 12, Hillyard, Washington

Wanted Position as superintendent or manager of orchard, either bearing or young trees, by man of 17 years' practical experience in and around Wenatchee Valley. Understands the work thoroughly and can handle men to the best advantage. Am not afraid of work and can make good anywhere. Also understand promoting orchard projects. Best of references. Address D. F., care "Better Fruit."

HORTICULTURIST AND FARM MANAGER

Orchard or general farm superintendent of several years' practical experience in Oregon and California, also graduate of an agricultural college, will be open for engagement March 15th. Address H.E.W., care "Better Fruit."

Experienced Orchardist

wants work on fruit farm. Position with company developing young orchard preferred. Have planted and cared for young orchards for eight years. Am young man of sober habits and honest, with high school education and capable of overseeing men. Can give references. Address WM. WING, Omak, Washington.

Position Wanted!

By expert nurseryman and horticulturist as superintendent of nursery or large orchard. Twenty years' experience, covering all branches of the work from propagating to marketing fruit. Address "R," care "Better Fruit."

WANTED

A man to take charge of newly equipped up-to-date canning factory on a percentage basis. Write Lock Box 146, Post Falls, Idaho.

The Car to Keep

Reo the Fifth

Consider these things—you men who this spring buy a car to keep.

Here is a chassis designed by R. E. Olds after 25 years of car building. It is built slowly and carefully, regardless of cost, to mark the utmost in an honest car.

The steel is made to formula, and analyzed twice to prove the needed strength.

The materials are all made to specifications and tested in our laboratory.

We apply to every vital part the severest tests men know. Each engine gets five very radical tests, requiring 48 hours.

We insist on exactness. Parts are ground over and over. Inspection is carried to extremes. And for years we have kept these cars on the road, running night and day—as far as 10,000 miles—to discover any possible weakness.

This Is Costly

We use 15 roller bearings—190 drop forgings. This is because com-

mon ball bearings break, and steel castings too often develop flaws.

We limit our output, so these cars are never hurried.

Our driving parts are given 50 per cent over-capacity, to leave ample margin of safety.

All these things are costly. We could save at least \$200 by building a short-lived car.

But the result is safety, absence of trouble, little cost of upkeep. The result is a car which, year after year, runs as it runs when new.

These are the vital things to consider when you buy a car to keep.

Electric Starter New-Style Body

Reo the Fifth this year comes equipped with electric starter and electric lights—the latest and best devices of this kind. It comes with dimming searchlights and electric horn. In every way the equip-

ment is modern and complete.

And it comes with a new-style body—the coming streamline body. Cars which have the old angle dash will soon seem out-of-date.

Never before has such a handsome model appeared in this class of car.

Now \$220 Less

And the price is \$220 less than last year's model with electric equipment. This is because we have for three years centered on this chassis. The costly machinery, tools and jigs have been charged against previous output. From this time on they are taken out of our costs.

In worth, in beauty, in equipment and price, this year's Reo the Fifth comes close to finality in this class of car.

A thousand dealers sell it. Ask for our catalog and let us direct you where to see this car.

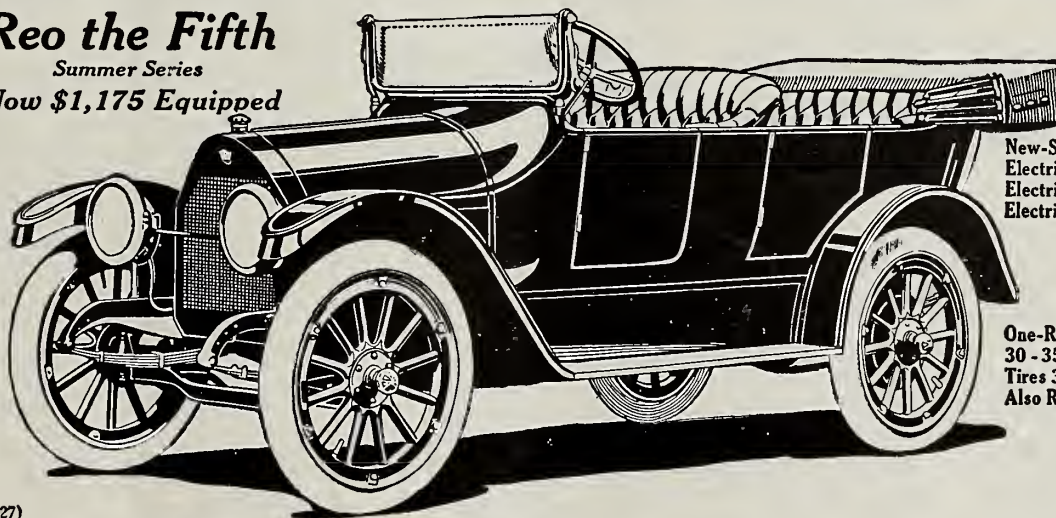
REO MOTOR CAR CO., Lansing, Mich.

Canadian Factory, St. Catharines, Ont. Canadian Price, \$1,575.

Reo the Fifth

Summer Series

Now \$1,175 Equipped



New-Style Body
Electric Lights
Electric Starter
Electric Horn

One-Rod Control
30-35 h. p.
Tires 34x4
Also Roadster

(227)

In the packing and handling of this fruit, and also of the pear, the growers of the state have a big problem. In a recent trip which I made to the East I noted that the pears which were offered to the public were often of poor quality. On the one hand they tended to be granular and mealy and of rather poor flavor, and the fruit showed a tendency to core rot. This is very much the same as the trouble with the Jonathan and is due invariably to poor handling, especially where the pears have hung on the trees too long. On the other hand, I found quite a few pears that were green, leathery, of tough texture, very poor quality and often undesirable flavor. These pears have generally been picked too green and not allowed to remain on the trees long enough.

There is a wonderful opportunity for building up a fine pear business in the East, and the Bosc and Anjou pears which were offered on the market, when in splendid condition, were certainly very attractive and brought forth many favorable comments. Too many, however, arrived in poor condition. It will be only by careful study and constant care on the part of the grower to keep up the desired grade of pears that this market can be satisfied. It is much more difficult to determine the proper time of picking pears than to determine the proper time of picking apples. Pears have to be picked in a green condition. Unless they are picked and shipped to the market in a hard, green condition they are apt to be granular, coarse and stringy, and will also develop this core-rot condition already

mentioned. However, if the pears are picked a little too green before they have reached a certain degree of development they tend to shrivel or they may simply be leathery in texture and practically flavorless, or at times even take on an undesirable flavor.

In order for a pear to have a melting flesh, one that is fine grained, free from granules, which contains lots of juice and has a delicate flavor, the fruit must really mellow after it is picked and not be allowed to mellow on the tree. You can all probably remember cases where in the fall you have seen Bartlett or Clapps Favorite pears grow upon the top branches of the trees where it was difficult to pick them. These pears had developed a wonderfully handsome color, a beautiful yellow to orange color, with a fine blush.



Mr. W. A. Johnston of The Dalles shipped a car containing 200 Kimball Cultivators to Michigan, which is the first carload of implements ever manufactured in Oregon and shipped East. The Oregon-Washington Railroad & Navigation Company officials had the car spotted and Mr. Johnston had a photograph taken. On the side of the car was tacked a banner which read, "The First Car of Agricultural Implements Made in the West and Shipped East. Kimball Cultivators, Manufactured by W. A. Johnston, The Dalles, Oregon."

The Best Implement for Successful Orcharding is the **KIMBALL CULTIVATOR** The Great Weed Exterminator

It not only preserves the moisture, but destroys the hiding places of insects, such as curculio, which are often serious orchard pests. Apples grown in cultivated orchards ripen later, and consequently keep longer. They are of larger size and are usually smoother.

The cost of cultivation is not excessive if Kimball Cultivators are used.

The Kimball Cultivator is made in all sizes, which enables us to give anyone the size necessary to do his work, whether he needs the 4½-foot size for the small farm or the 17-foot size for the large summer fallow fields. We recommend the 8½-foot size in most cases, as it is the best size for two horses, and better work can be done with it than can be done with other sizes.

Note prices on various sizes quoted below. Send in your order at once, or write by return mail asking for booklets and particulars. All quotations are f.o.b. The Dalles, Oregon, but we will arrange to have a carload in some Eastern city for the spring of 1914, so that shipments may be made direct from that point.

Retail Price Schedule of Kimball Cultivators

	Price
No. 4. 4½ feet, 6 blades, weight complete 70 lbs.....	\$13.50
No. 5. 5½ feet, 7 blades, weight complete 85 lbs.....	15.00
No. 6. 6 feet, 8 blades, weight complete 100 lbs.....	17.50
No. 7. 7 feet, 9 blades, weight complete 115 lbs.....	18.50
No. 8. 8½ feet, 11 blades, weight complete 125 lbs....	20.00
No. 9. 10 feet, 13 blades, weight complete 140 lbs....	25.00
No. 10. 12 feet, 15 blades, open center, weight complete 160 lbs.....	22.50
No. 11. 12 feet, 15 blades, weight complete 185 lbs....	30.00
No. 13. 18½ and 19 feet, 23 blades, gangs fully rigged, weight complete 300 lbs.....	47.50
Extra Frames \$1.00 per foot; weight 10 lbs. per foot.	
Extra Blades \$1.50 each; weight 5 lbs. each.	

You need the Kimball Cultivator in your business. Write at once and arrange to have one of these implements ready for your spring work. Mention "Better Fruit" when you write.

W. A. JOHNSTON, The Dalles, Oregon

Yet if you should shake these pears from the tree they would go to pieces when they struck the ground. This illustrates the condition which pears will arrive in in the market if they are allowed to hang on the trees too long.

Our pear growers on the Pacific Coast have a wonderful opportunity. I would suggest that they do a little more advertising. I noted that in many of our Eastern markets the apples were named in the fruit stores; that in front of the pyramids of apples there were also placards which gave the names of the varieties. While occasionally these names were wrong, in the majority of cases they were correct. Again, I noted that many of the apple growers are sending very nice placards, which are hung in the windows, calling attention to the section where the apples were produced, and quite frequently to the variety. This is splendid advertising. Our pear growers should follow suit. Very few people knew that the pears which were exhibited in the Eastern markets were Bosc, or that they came from Oregon. From inquiries I found that many of the Bosc pears were known by the dealer to have been produced in the Pacific Coast sections, yet he was not advertising this information to the general public. Not as many pears were exhibited in boxes as was the case with the apples. In apples the lithographed label helps very materially in advertising the fruit. The attractive label on the box and the attractive labels on the fruit go a long ways to educate the public as to the source of supply. But most of the pears were exhibited unwrapped. In only a few cases did I see pears with lithographed labels, nicely wrapped, exhibited in the retail fruit stores. The pears are in great demand and were bringing very fine prices. About the cheapest good grade Western pears were retailing at five cents apiece, or sixty cents a dozen.

I took pains to acquaint as many people as I could concerning the merits of the varieties of pears, and wherever I mentioned the Western Bosc pears the people were loud in their praises, and in most cases said they would take steps to secure such fruit. To show you the value of needing to name our pears, in one of the leading hotels in an Eastern city I found "d'Anjou" on the menu as "Anchou." The hotel buyer had heard the fruitman say they were d'Anjou, but not being acquainted with the name he was advertising a variety which did not exist. I found also that wherever pears were labeled there was more of a tendency to mislabel them than was the case with the apples.

40 Acres at Bloucher's Station \$75 per Acre

The SW¼ of the NW¼ of Section 29, T.2 N., R.10 E. The river crosses one corner. Private roadway from station, distance 1,000 feet. One-third cash, balance 6% to party who will improve. Address JAMES N. DAVIS, 601 Journal Building, Portland, Oregon. No Agents.

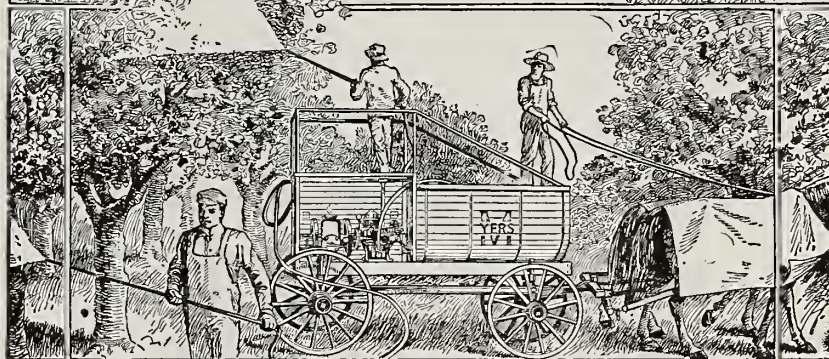
Diversity and Fruit Growing

By George Laithwaite, Goderich, Ontario

I HAVE been a reader of "Better Fruit" for a few years. Although a reader of six or seven such papers I find time and am interested in your writing and make a clean job of reading your paper. In December issue features of writing were somewhat after our class of fruit farming and with eighteen years of experience of our own with my younger life following same line on father's farm, I feel inclined to give some new beginner some of my experience. We must remember experience is a great teacher. No matter if the reader of this letter is 2,000 miles away, I know the ups and downs of life as a fruit stock farmer and I feel for those who sometimes do not get the sunny side of life.

Our farm is 120 acres, situated two miles from Lake Huron, one mile from Goderich. If you look on the map you will think it is cold here, but we keep on our farm from 20 to 40 Jerseys, 50 to 100 pigs, some sheep that keep the weeds down, geese, turkeys, and about 200 hens. We have about 3,500 fruit trees, peach, pears, plum and apples in our orchard. We work from nine to twelve feet each row continually until August, and then we sow rape or vetches for cover crop. Between these rows we grow corn for silo, alfalfa for our horses, cows and pigs. We feed our sows second growth alfalfa in racks. Like cattle, they will keep in a healthier condition than when fed too much heating grain. We farm this way for two reasons: First, I am raising a family of three boys and three girls and I have to keep the wolf from the door while I am growing my fruit trees (it takes about ten to twelve years to bring apple trees to bearing age here), and second, we keep the fertility of our soil up by this system of diversity. Judging from reading the December issue the most of fruit growers in the West have been speculating on fruit growing. The stock raising will be new to them. Do not be discouraged if you should not make a success the first year or two. You will find your pigs will get sick and die, your cows will get garget in their udder, young cattle get diseased, the hens will lay no eggs and one hundred and one things will happen which will give you experience which will teach to better success, and you will find as I did, that every branch of farming is a science and an iron by itself and wants pounding while hot. Every fruit grower knows the diseases of fruit trees and your government tries to keep them under control. Animals are much more subject to disease and in a new country where you have to import your stock you have the strictest of laws governing contagious diseases. Have no animal come into your herd without the tubercular test. Start with health and you have a chance to keep them so. Don't get balled up on too much pedigree and fancy breeding. If they will not produce they are only scrubs.

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Many styles of spray pumps now on the market prove to be failures when the real test comes—the actual spraying operations.

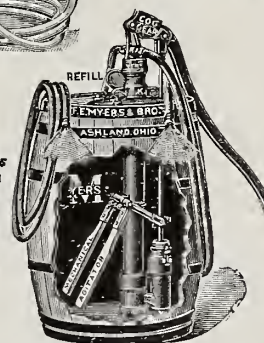
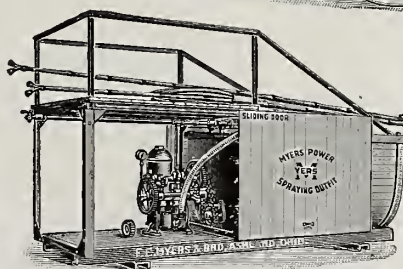
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Start with health first, for if you have contagious diseases it will injure the best of breeding. If you have a dairy cow back your pedigree up by ancestry of record of performed test and see there is not too much inbreeding. Bring on your fancy type, it pleases the eye and spoils the pocket. Our experience with hogs, keep your sow from large litter, cross breed, first cross produces a stronger pig. York and Chester go well together, also Berk and Tamworth are good. Do not keep your sow fat. Feed young pigs

milk. The pleasure part of your mixed farming along with your fruit is when you have a failure of fruit crop in the fall and in the winter sit down to your table of plenty, produced by your cream, butter and cheese. We always kill a ten-month or year old Jersey calf for our meat for winter. You have your roast duck, goose, turkey, chicken and your own cured bacon. You have the first and best and you can sell the rest to your neighbors who specializes in fruit growing.

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HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
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All Communications Should Be Addressed and Remittances
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Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

February edition of "Better Fruit" in a broad sense contained valuable information along original lines of investigation and thought in connection with the fruit industry, particularly of the marketing features as influencing factors, which everyone interested in the fruit industry should read. "American Fruits in Foreign Lands" by Mr. H. N. Gilbert; "Influence of the Panama Canal on the Northwestern Fruit Industry" by Mr. J. N. Teal; "Marketing Fruit from Producer's Standpoint" by Hon. H. B. Miller; "Apple Market Investigations" by Hector MacPherson; "Marketing Fruit from Banker's Standpoint" by Mr. Edward Cookingham, were all along original lines of thought and full of valuable information for the fruit grower. This has been pronounced the broadest and best issue of Better Fruit for many months. In addition to this it contains an excellent article, "Insects and Diseases and their Control" by Mr. S. W. Foster, for many years connected with the Government Department of Horticulture. If you have not subscribed to "Better Fruit," send in your subscription at once, and ask for the February edition, as we have a few copies left. We will be willing to supply the February edition at 10 cents each, as long as the supply lasts.

Professor R. H. Pettit, entomologist of the Michigan Agricultural College, has called our attention to the article in the January issue of Better Fruit, "Oil Sprays," on page 33, referring to Dr. Shafer's Bulletin, "How Contact Insecticides Kill," as emanating from the University of Michigan. This bulletin should have been credited to the Michigan Agricultural College.

The Value of the Vegetable Garden to the Orchardist and Farmer.—The Experiment Station of Illinois planted a vegetable garden of such size as would meet the requirements of a family of five, in round numbers. The seed cost \$5, and the labor \$30. Every hour's time that was put in on the garden was figured at regular wage rates. The vegetables consumed were weighed and charged to the family at the market price, and amounted to \$105 during the season, which did not include such vegetables as the grower would consume in the winter, such as potatoes, onions, etc. As the fruit grower and farmer usually cares for his garden at odd times, frequently in the evening after supper, the labor cost is not an actual cost to him, and therefore the food value he has received at the market price is equal to the total value, less only the cost of the seed. In other words during the vegetable season the fresh vegetables obtained from a small garden, if bought at the store, would cost \$100. It is too bad that too many of the fruit growers buy their vegetables instead of growing them.

The United States Department of Agriculture recommends that instead of a trip to Washington, D. C., the prize winners of the boys' and girls' clubs for corn, canning, poultry, etc., should be given a course at the agricultural college within their own state. The department considers that such a course would have a much more lasting influence and be of much greater benefit to the boys and girls than flying trips to the capital. Boys' and girls' clubs are becoming very popular. We hear of boys' clubs for corn growing, vegetable growing and poultry raising throughout the many states in the East. It is time for the Northwest to wake up and organize boys' and girls' clubs for corn and vegetable growing, poultry raising, fruit growing, etc., and to arrange proper prizes. We agree with the Department of Agriculture. The best prize that can be given would be a course of instruction at the agricultural college.

Power Outfits.—Almost every orchardist who buys a power outfit, after using a hand pump, says he would never be without a power outfit. Every fruit grower who has an orchard of any size should have a power outfit because it does the work more efficiently and in a more economical way. We suggest that sometimes where the acreage is too small that a fruit grower may combine with his neighbor and the two together purchase an outfit.

Every fruit grower should overhaul his spray rig and see that it is in proper condition for the work this spring and summer. In fact the spray outfit should be thoroughly overhauled this time of year and put in perfect condition.

Tying Trees.—Most orchardists do their tying and propping in the late summer when the apples are about half grown. Now is the time to do the tying because there is no foliage on the trees, consequently you can easily see which limbs need tying, and for the same reason you can see more readily and quicker which limbs to tie to. At the present time there is no danger when tying of knocking off the blossoms or apples, which are easily knocked off in the process of tying later in the year. It is also a good time to do the tying for the reason that during the spring there is much wet weather so the orchardist cannot work at cultivating. In the fall fruit growers are usually very busy. In fact the best time to do the tying is before pruning because many limbs bent down with last year's crop can be tied up in place instead of being pruned off.

Good Roads.—There is probably no subject before the great American public commanding more attention than "good roads," and no subject that is more important to the fruit grower. In fact the fruit grower needs good roads in his business more than any other class of farmer for the reason that his fruit must be delivered to the depot with the least possible shaking and bruising. It is only over good roads that this can be done successfully. Every fruit grower should interest himself in the subject of good roads and should be willing to pay any reasonable tax if satisfied that the money will be intelligently and honestly spent.

The Panama Pacific International Exposition will open February 20, 1915. A large space will be devoted to horticulture and every fruit grower should begin to plan to attend this exposition by laying aside money for the purpose of attending and taking his family. The exhibit will be educational and it will be an opportunity of a lifetime. In all probability no other exposition will ever be held which will equal in magnitude the Panama Pacific International Exposition. No other exposition will ever be held so near home which can be attended at so little expense by residents of the Pacific Northwest.

Seed Potatoes.—At the short course at Pullman, Wash., one of the professors stated the proper method in selecting seed potatoes was to select the seed from the hills where the potatoes are all uniform and about the right size. This method of selecting in three years doubled the potato yield.

Our old subscribers should read the December, 1911, edition of "Better Fruit" before tying their trees, as this number contains some valuable information. For the benefit of our new subscribers it is our intention to republish this article in condensed form in the next issue.

The New MYERS POWER SPRAYER IS BUILT AS YOU WOULD BUILD IT



had you the facilities and material at our command. It is made up of round bottom wooden tank, equipped with propeller agitator, a Myers Duplex Power Spray Pump and a 2½ (or one) H.P. STOVER GASOLINE ENGINE. It has platform with detachable railing, heavy angle steel frame, sliding doors on cab. It will maintain a continuous pressure of 200 pounds on four nozzles, will turn short corners and can be unmounted so that the truck may be used for other purposes. Let us submit price and circular giving full details of both large and small sized outfits. Mention this paper.

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More interest has been taken in cover crops during the horticultural shows held during the past winter than ever before in the history of the business. The benefit to the orchard has been demonstrated conclusively and it has also been shown that cover crops can be produced in orchards of fairly good size in quantity so as to provide enough feed for a few cows, thus enabling the fruit grower to do a little dairying, which will bring in extra profit during every month of the year. Already more creameries are being organized, some on co-operative basis with creamery routes being established, which seems without question a step in the right direction.

A splendid phosphate bed has been located in Wyoming, which ought to prove of great benefit to the fruit growers of the Northwest on account

of the closeness of the supply. Originally nearly all the phosphate used in the Northwest has been found in the South and the expense of getting it to the Northwest has been very heavy in freight.

Correction in January Edition.—Through a typographical error the leading article, "Sprays and Spraying," was credited to Prof. H. S. Jackson, and Prof. H. F. Wilson, of the Experiment Station, Corvallis, Oregon. This article should have been credited to Prof. H. S. Jackson and Prof. H. S. Wilson.

In the February issue the article on "Insects and Diseases and Their Control" was credited on the cover page to Mr. J. H. Wright. This article was written by Mr. S. W. Foster, entomologist, and manager of the insecticide department of the General Chemical Company, San Francisco, and should have been credited to him.

The National League of Commissioners have decided to discontinue their weekly bulletin, for the reason that the expense was great in publishing and mailing same, and for the further reason that it was read very little by its members. They ought to subscribe to "Better Fruit," because it contains much valuable information, which is expressed in such an interesting way that it is always read. If the members

of the National League of Commissioners would spend the money in subscribing to "Better Fruit" which they spent in subscribing to their bulletin, they would get something they would never fail to read.

Weiser, Idaho, a town of only 4500, has just completed public improvements amounting to half a million dollars in value. They include water-works, street paving and grading, sewer system, cement sidewalks and concrete curb and gutters.

W. van Diem

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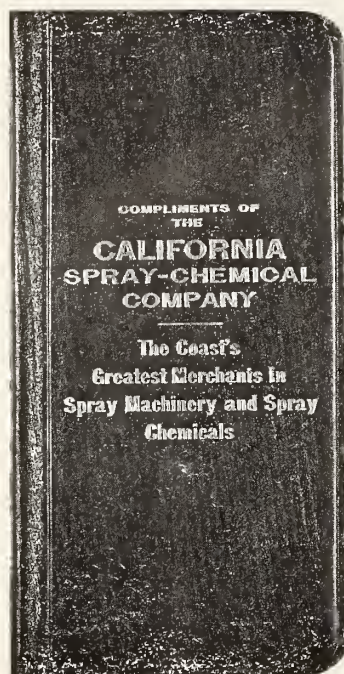
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Luther Says: Spray, Spray, Spray, but be sure you Ortho Spray.

Luther Says: If you connect up right now with Ortho Sprays, he is mighty sure you will be glad you did. Our hosts of satisfied users will have none but our Ortho goods. They have found them the kind they can always bank on. Make up your mind that Ortho Spray is the spray for your money, and get your order in today. We promise prompt delivery from our various agencies.

Luther Says: Let Cupid meet you face to face. Cupid is our Sales Manager. I am a very busy man, among very busy men, busily making Ortho Sprays in the largest spray factory in the world, but it will be well worth your while to clip the coupon and mail it to me.

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I have checked the items I am interested in.
Send me a "Friend" catalog. This coupon is worth \$1.00 in the purchase of goods to the amount of \$10.00 or more, if returned within 30 days from date of issue.

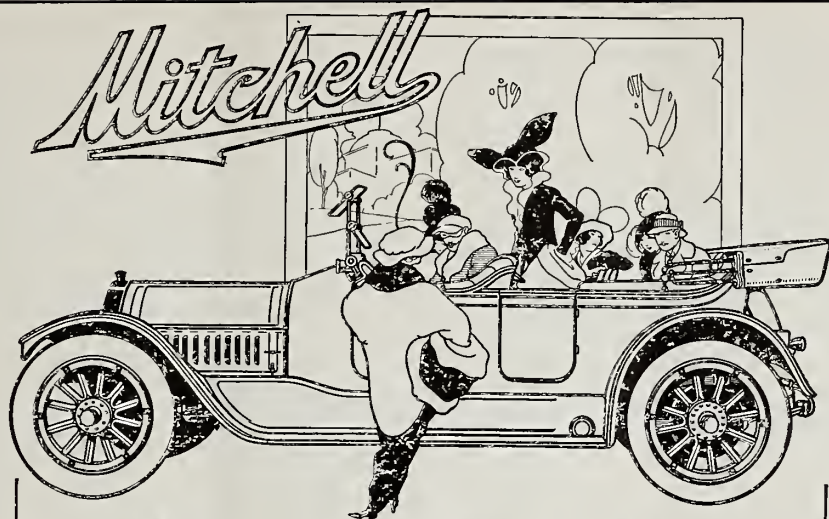
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The Mitchell car is built to give where the give is necessary—to resist the strain and sudden jolt—to surmount these and other difficulties without the disastrous wear and tear which makes other cars burdens after a year's use—or less.

Farmers need better cars than people who live on smooth boulevards and there are hundreds of modern farmers who will tell you that the Mitchell has lasted them—in constant use—five, six, seven and eight years and are still the splendid utilities today that they were when bought.

The Mitchell car is more car and better car for the money than any other car in existence and we commend it to the farmer who wants an economical utility rather than an expensive luxury.

The Mitchell Models for 1914:

The Mitchell Little Six—fifty horse-power—132-inch wheel base—36x4½ inch tires—two or five-passenger capacity - - -	\$1,895
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Land Clearing in the Northwest

By Thomas Cunningham, Farm Manager for Western Fuel Company

IT is my intention in this article to deal particularly with the actual work of land clearing. Much has been said and written on this subject and still land clearing remains an arduous task. To get down to hard facts: There is on each acre of land a given quantity of wood to extract from the ground and burn. There is also a given quantity of soil to handle in grading and leveling the ground to make it suitable for farm implements to do their work on. All this work requires power to accomplish, whether it be machine power, horse power, manual labor or explosive powders. We cannot get away from these facts.

Stumping may be divided into five distinct methods: First, by burning in the ground; second, destroying by chemicals; third, digging out by manual labor; fourth, by blasting and then burning; fifth, by pulling the stumps and then burning.

Burning in the ground has been advocated and experimented with in several ways, the principal ones being "the char-pit method," the "forced draft method," and the "air-tight dome method." None of these methods have proved to be practical successes. The charpit method requires too much preparation in the way of gathering sufficient small wood to give the fire

a proper start and also in banking with dirt. Again, all soils are not suitable for use in banking with dirt. There must be sufficient clay in the soil to allow it to bake, otherwise it will fall in and smother the fire. Also, it is only in the very dry and resinous stumps that the fire will follow the roots below plow depth. I have watched demonstrators demonstrating the forced draft on green fir stumps and they have had to give up in disgust. The air-tight dome method is similar to the charpit method, only that instead of banking with dirt an air-tight dome made of sheet steel is placed over the stump. This is not practical as it would be a very slow method, unless a person had a number of air-tight domes, which would make it very expensive. I understand this method also fails to burn the roots below the plow depth.

Digging out by manual labor is too slow and costly to be even considered. In an experience gained by clearing some four hundred acres of land I have come to the conclusion that a combination of pulling and blasting is the only practical way to clear land. That is to say: Pull out the smaller stumps whole. Then blast the larger stumps and pull out the remaining portions, if any, and burn. In preparing to blast a stump, good judgment must be used in placing the powder. Dig well under the body

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of strictly pure Lime and Sulphur Solution endorsed and recommended by our leading horticulturists. Read what some of them say of the Aetna Brand:

W. K. Newell, President State Board of Horticulture: "I have used the Aetna Brand in my orchard for years and I am sure you are making a good article."

A. C. Goodrich, Commissioner First District: "I have used and found every barrel full up to test and very free from sediment."

H. C. Atwell, ex-President Oregon State Horticultural Society: "I don't think there is a better spray made."

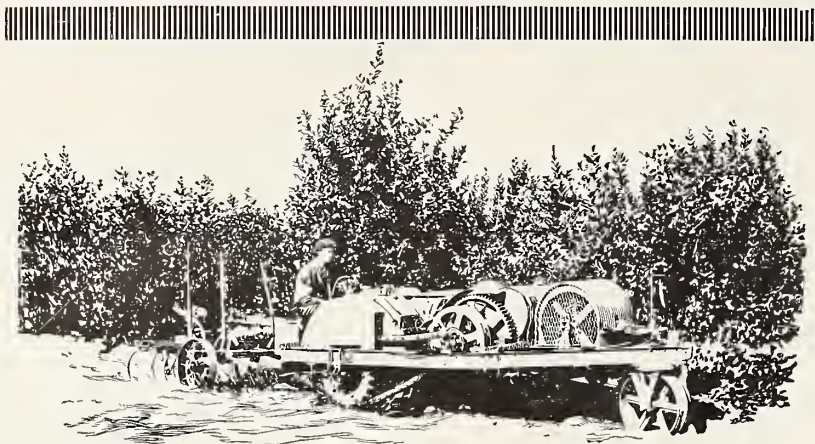
S. J. Galloway, Fruit Inspector Washington County: "After very severe tests I find the Aetna Brand O. K."

Ben S. Worsley, Fruit Inspector for Clatsop County: "I wish to congratulate you on the superior Lime-Sulphur Solution, the Aetna Brand."

My 25 years of orchard study enables me to manufacture the best on the market. For prices in small or large quantities, write to

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Like The Horse's Hoof

the patent drive wheel of the

Rumely ToeHold Tractor

grips the soil without packing it. It gives the flat backward pressure that enables the ToeHold to deliver so much of its power at the drawbar.

The ToeHold is low, narrow and light. It weighs only 8,400 pounds without extensions or shields—10,000 pounds with full equipment. Its height with limb shields is only 5 ft. 3 in., and its width with extensions but 8 ft. 6 in. It burns gasoline or stove-tops.

The ToeHold is one of the handiest tractors made. It will plow as close to the trees as a team and will turn a 10-foot circle. It is designed especially for orchard and vineyard work, but is excellent for plowing, hauling, and all other power jobs.

The ToeHold is California-built. Scores are in successful use everywhere. We have interesting literature for you. Ask for it and for the name of nearest dealer.

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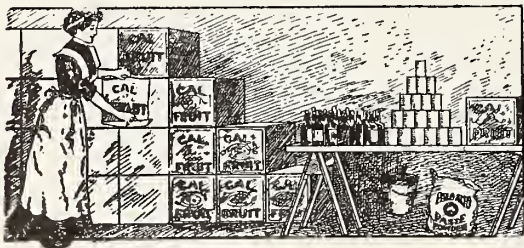
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of the stump, taking care to have the powder placed under the point of greatest resistance. Care should be exercised in digging to a good depth leaving a foot to eighteen inches of soil between the powder and the body of the stump. This permits of the charge being more firmly tamped and in case the center of the stump is weak it distributes the energy created by the explosion of the powder more evenly over the root system and prevents breaking of roots in the ground.

Taking up the question of stump-pullers. These are divided into sev-

eral classes, gasoline stumping outfits, steam donkey logging engines, horse-power stumping machines and hand-power stumping machines. Gasoline and steam donkey outfits have their use in sections where labor is not easily procurable, but I consider them to be costly. The cost of the outfit is heavy. Their bulk and weight makes their transportation from one point to another extremely costly. The operating gangs of such outfits are high priced men, commanding all the way from \$4.00 to \$8.00 per day. The cost of upkeep

in the way of cables, blocks, etc., is also very high. This is caused by the fact that the haulage rope on these engines travels at a given rate of speed and when the power is suddenly applied to a heavy inert mass, such as a stump, the sudden jerk places a tremendous strain on ropes, blocks, etc., causing many breakages and delays. Delays with a high priced gang mean additional cost. Theoretically, there is no necessity for a sudden jerk with these engines, as they are supplied with a friction gear, but "Did you ever watch the sudden slam and then the quiver of the suddenly tightened rope on a donkey engine?"

The most economical, powerful, safe and satisfactory stumping device I have yet seen is a hand-power stumping machine known in the United States as the "K Hand-Power Stump Puller," sold by W. J. Fitzpatrick in Seattle, Washington. This machine weighs about 171 pounds and can be wheeled around anywhere like a barn truck. I venture to say that it will come off with flying colors in a contest with any of the various makes of horse-power stumping machines. It is built on the double-action pawl and ratchet principle. I heard about this machine last fall and

"Diamond Quality"

Seed Potatoes

Grown on high land

TRUE TYPE, market size stock that will yield the maximum crop of shapely, saleable tubers.

EARLIEST OF ALL PRIZETAKERS
OREGON—SNOW—SCOTCH ROSE
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AND OTHER STANDARD SORTS

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of this vigorous, healthy stock that is grown under our direct supervision and is famous for quality and record yields. Prices are low and you can greatly increase your profits.

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tells about our seed potatoes and other good things for Northwest growers.

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TRADE MARK

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traveled twenty miles to see it, very skeptical as to the stories I had heard about it. The agent attached it to a standing tree (fir) about 36 inches in diameter, placing the cable about 12 feet up the tree. I took hold of the lever and pulled the tree down myself in eight minutes. I bought the machine on the spot and have pulled the stumps from 30 acres of land with it since, the machine costing not one cent for repairs. Very recently I gave a demonstration of stump pulling to the members of the Royal Commission on Agriculture, appointed by the Government of British Columbia. In this demonstration I first attached a large-sized horse-power stump puller of the capstan variety to a fir stump about 20 inches in diameter. This stump was on an open, gravelly soil and the roots penetrated quite deep. I hitched a 1600-pound horse to the stump puller and it failed to move the stump. I then attached the "K Hand-Power Stump Puller" to the same stump and pulled it out quite easily in seven and one-half minutes, the roots being pulled out clean and clear. While pulling the stump (as is my usual custom) I kept a man with a mattock knocking the dirt from the roots as the stump was raised and allowing it to fall back into the hole made by the lifting of the stump. By doing this the ground is left nearly level and requires very little grading afterwards. Naturally, the members of the commission were greatly delighted with the machine and in order to personally test it Mr. Hayward, M. P. P., chairman of the commission, and Mr. Shannon, one of the members, took hold of the lever and pulled out a stump themselves.—(Advertisement.)

Tobacco Sprays

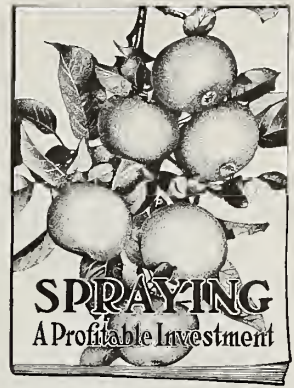
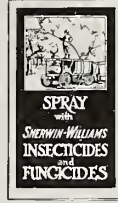
Professor A. L. Melander, entomologist of the State Experiment Station, Pullman, Washington, gives the following information about tobacco sprays. For such insects as do not actually chew and swallow particles of leaf matter—in this class, particularly the various species of aphids—there is no better spray than the tobacco preparations. The sprays may be made at home by steeping cheap tobacco with water from thirty minutes to one hour. The decoction should not be boiled but kept just under the boiling point. Tobacco scraps may be used in making this decoction at the rate of one pound of leaves to every four gallons of final dilution, or two pounds of stems to make the same amount.

Extracts of tobacco are now on the market which do away with the trouble of preparing the decoction. They are highly concentrated and should be used according to the directions on the containers. The best known of these is now sold in Washington by the carload and is a product of the Kentucky Tobacco Products Company. It is known as "Black Leaf" and may be used one part added

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Every visitor who approaches Durham, N. C., where "Bull" Durham is manufactured, is impressed with this delightful, distinctive fragrance that envelopes the whole city. There is nothing else like it in the whole world.

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(Enough for forty hand-made cigarettes in each 5-cent sack)

Enough "Bull" Durham is sold in a year to make approximately 12 BILLION cigarettes—as many as all brands of ready-made cigarettes in this country combined—and the sales are steadily growing. Proof that millions of smokers prefer the cigarettes they roll for themselves from "Bull" Durham, to any ready-made kind.

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Do your dormant spraying now before the new buds open in the spring.

This is important.

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A little care and expense now will make dollars for you when you harvest your crop.

Special spray materials are made for special troubles and special localities.

Tell your troubles to Mr. Foster in a letter and he will give you a personal answer by letter.

**Send for Special Information
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You can fill this out and get a complete idea of the condition of your orchard. This blank will explain your troubles to Mr. Foster and he will tell you specifically just what you ought to do and how you ought to do it. You cannot overlook anything if you fill out this blank.

GENERAL CHEMICAL COMPANY
OF CALIFORNIA
Royal Insurance Building
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to from sixty-five to one hundred parts of water. The black leaf is a thick, syrupy, black substance which may soil the fruit. A new form of the spray is called "Black Leaf-40." This is nicotine sulphate and is so concentrated that it will go ten times as far as the old black leaf. At this dilution it does not stain the fruit and, therefore, may be used on fruit about to be harvested and on vegetables such as lettuce, peas, etc.

Any tobacco spray has its effect greatly increased by the addition of soap. Soaps made of cresylic acid, sold on the market as "lysol" or "cresol," have the property of liberating nicotine. If they are added to the tobacco sprays they will permit a greater dilution of the tobacco. However, in the case of black leaf-40, which is nearly pure nicotine, they are no more valuable than ordinary soaps. Fish oil soap, whale oil soap, common laundry soap, or even washing powders may be used in combination with the tobacco sprays at the rate of about one pound of soap to every fifteen gallons of the spray. Most insects have a greasy body. The tobacco spray should wet them in order to kill them. A water spray will not adhere to the insect's body, but the addition of the soap makes the spray adhesive and also makes it have greater penetration. The tobacco spray is particularly adapted as a summer spray. It is extremely valuable for all kinds of aphids, including those species affecting house plants. The woolly aphid, black cherry aphid, the various species of green aphids, the leaf-hopper, red spiders, flea beetles, and the young of scale insects, all can be controlled by this spray. This makes probably the best spray for oyster shell bark louse and should be given for that insect as soon as the young hatch, which is usually about the first of June. Although primarily a contact spray, the tobacco kills partly by suffocation. For this reason, it surpasses the other contact sprays, like kerosene emulsion or whale oil soap. After an aphid has curled a leaf it is difficult to control it with kerosene emulsion, for the curled leaf keeps the spray from touching the aphid's body. A drop of tobacco spray, however, in the leaf will give off fumes which will prevent the breathing of the aphid and thus can be depended upon even though the tree may have its leaves badly curled.

Nurserymen's Convention


The thirty-ninth annual convention of the American Association of Nurserymen will this year be held at Cleveland, Ohio, June 24 to 26. A communication from the secretary says that it is as yet somewhat early to furnish much that is definite in regard to the arrangements for what is hoped will prove to be one of the largest and most interesting gatherings of the association. The central location of the convention city will make it comparatively easy for the majority of the membership to attend; the time of



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Walnuts**

A prominent doctor of Portland, writing us recently concerning Vrooman Franquette Walnuts, said: "I have asked several grocerymen what proportion of walnuts they sell as compared with other nuts, and the average is TWELVE TIMES AS MANY WALNUTS AS ALL OTHER NUTS COMBINED. People are beginning to know the food value of walnuts, and when they realize that ONE POUND OF WALNUTS LIKE THE VROOMAN FRANQUETTE CONTAINS AS MUCH NUTRIMENT AS THREE POUNDS OF BEEF OR MUTTON there will be more eaten and some of the high cost of living will be solved."

If you have room for some walnut trees, you will find them the best investment you ever made. Our trees are large, heavily rooted, healthy—first class. Why not order some trees at once and have them delivered for planting this spring. We have all varieties of other fruits also.

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meeting will also operate favorably to that end. Reports from the committees responsible for the general arrangements, such as hotel, program, exhibits and local entertainment indicate that good progress is being made. From the favorable comments heard regarding the selection of The Hollenden as convention headquarters it is evident that no mistake has been made. From Mr. W. B. Cole, of the entertainment committee, we learn that Mayor Baker, of Cleveland, has consented to extend the welcome to the association. Mr. Baker, as is known, is a national character, and anything he has to say will interest the nurserymen. At the meeting of the Ohio Nurserymen, January 21st, the following tentative program was adopted: One evening moonlight ride on the lake; one evening a banquet and other entertainment; and there will also be a theater or matinee party for the ladies. The city forester and the city department will arrange for a trip through the public parks and boulevards. President Pilkington, as chairman of committee on membership, the latter being composed of the state vice-presidents, is hopeful of encouraging results. The secretary will soon be able to announce particulars of railroad facilities, and is now engaged in preparing the annual appeal for early renewal of memberships and reservation of badge book spaces. Those seeking information should address John Hall, secretary, 204 Granite Building, Rochester, N. Y.

Haul the Manure and Spread It Now

Of all the year now is the best time to return as manure a part of the fertility that has been taken from the soil the past year or years. The ground is frozen so that you can get upon it with a load and this is a season when the farm hands and the teams are not needed for other farm work. If you have grass land which you expect to break after the next crop of hay that is a good place to put the manure. Orchard lands will do better, too, with a good coat of manure now but it should not be put close to the trunks of the trees for a home for injurious insects. A light surface dressing of eight to ten loads of manure per acre will increase the yield of grain next year if applied properly. For this a fine manure should be chosen and scattered uniformly so that no lumps will form to burn the small grain plants. If there is no other place to put the manure put it on the fallow land and you will be amply paid for your trouble in the next crop you raise there. In regions where moisture is likely to be low any year it is not a safe practice to plow manure under soil that is to be used for a crop the next year, especially if the manure is coarse. It will cause the soil to dry out.—P. P. Peterson, Professor of Soils, University of Idaho.

Readers of "Better Fruit" We have a large surplus of the finest 4 to 6-foot two-year-old *Jonathan, Wagner, Yellow Newtown, Stayman Wine-sap, Gano, Grimes Golden* and *Old Winesap* apple trees on rented land that we must vacate this spring. We are offering you the benefit of the circumstances. In order to move all this stock quickly we are going to make ridiculously low prices for it f.o.b. our shipping station.

Do not buy elsewhere until you get our prices, and if you doubt this stock being the best, we invite you to come and see it in our nursery—it will pay you.

In addition to the above stock we have our usual fine lot of one-year stock of fruit trees and ornamental stock and small fruits.

Guaranteed alfalfa and clover seed.

Send for catalog and price list.

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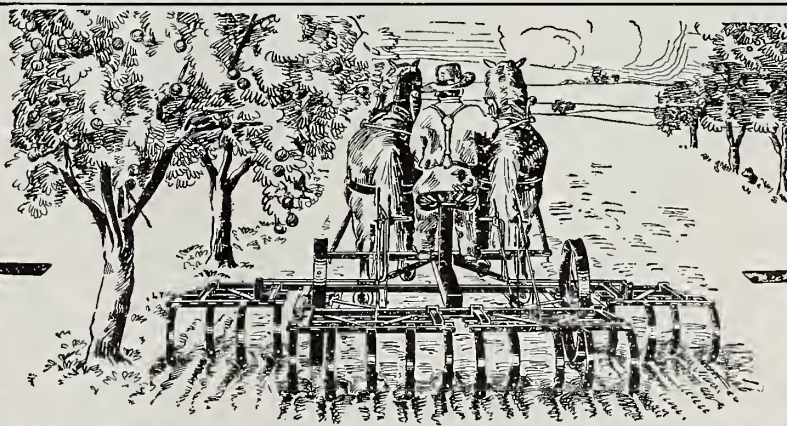
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The Forkner Light Draft Harrow

Broad Gauge—Works right up to the trees. Detachable end extensions reach far out from horses' path. Gets in under the lowest branches, stirring up the soil evenly and thoroughly without breaking boughs or knocking off fruit. *Neither team nor driver has to dodge the boughs.*

Light Running—Two horses will cover the ground quicker, easier and better than with any other.

Wheels Carry Weight—not your horses' necks. Whether you ride or walk, machine has perfect balance. Broad rimmed wheels run on greased axles, carrying weight of machine and driver.

Will Not Clog or Drag Dirt—Frame is well up above ground. Teeth lift soil and turn it way over.

Each Section Hinged In Front With Adjustable Couplings—Lever regulation in convenient reach affords easy control.

Built For Long, Hard Service—Frame of strong, angle steel—teeth best oil-tempered spring steel.

The Illustration Will Tell You Much if you are at all experienced with other lines. No fancy frills—but a machine with height of wheel, breadth of sweep and arrangement of teeth that means covering a lot of ground in a day and doing it thoroughly.

Write Tonight for free booklet "Modern Orchard Tillage" and catalog of these labor saving implements.

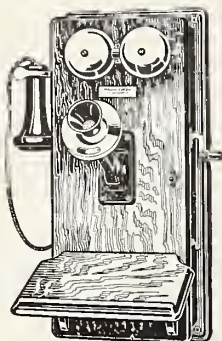
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in your
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Highest telephone quality

Made in the same shops where all "Bell" telephones are made, by the same expert workmen. No other rural telephone has such sturdy construction, positive action and clear, loud transmission.

It is a real pleasure to talk to folks with a Western Electric Rural Telephone. No need to yell. No need to repeat what you have to say. You hear distinctly—and so does the party on the other end of the line.

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Before you buy any telephone equipment or replace any instrument that may be now in use, write to our nearest house, as listed below, for our new illustrated book on rural telephones. Ask for book No. 145.

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EQUIPMENT FOR EVERY ELECTRICAL NEED

Soluble Sulphur

By F. A. Frazier, Portland, Oregon

SOLUBLE sulphur is a compound made by the melting, under a very high degree of heat and in specially designed furnaces, of sulphur and soda ash (not caustic soda), resulting in a soluble powder with 58 to 60 per cent sulphur. All sulphur in solution is caustic in a certain sense. The sulphur is simply more active in the solvent condition. The caustic property of soluble sulphur is due only to the sulphur in solution and not to the solvent agent. Much loose talk has been indulged in pertaining to things caustic. No properly made sulphur

spray ever injured a tree. Sometimes the fruit or foliage has been burned, but in most cases such burning is because of previous fungus infection and injury admitting the spray to the wounds caused, or a devitalized condition of tree where it does not have normal power of resistance. Soluble sulphur is sometimes spoken of as being more caustic than lime-sulphur. What is really meant is that there is a great spray value to a given quantity. All contact sprays in general use of any value have the caustic or burning quality. In a solution of soluble sul-

phur the tendency is to spread and penetrate until evaporation of the water leaves the finely divided sulphur thoroughly spread over the surface and effectually carried into the scale crusts,—thus a given quantity of sulphur in soluble sulphur spray will go further in effective work than the same quantity in the old time lime-sulphur spray.

In soluble sulphur the perfect spreading quality prevents the concentration of spray in drops, so when used in proper strength does no harm to the most tender plants. Soluble sulphur is, therefore, not only a superior scale spray, but a very effective and economical scab spray. There is also a valuable feature in that the trees assimilate very rapidly the sulphur in this form, thereby producing a greater vigor and extending to a better coloring of fruit. Soluble sulphur can be safely applied at winter strength up until the time the buds begin to open. In fact one of the most successful orchardists known to us uses this material at winter strength when first leaves of apple are the size of squirrel ears. He thus combines the winter strength spray with the first scab spray and at this time also the aphids are more susceptible to control. Sulphur, even the old time home-boiled and later the concentrated solutions, has been an element of no small value to Western orchards through the assimilation by the trees. The orchardists of the East know this truth better because of the comparisons which they have observed between sulphur sprayed orchards and those otherwise sprayed or unsprayed. If there is one factor above another to which the success of the Western orchards can be attributed, it is the thirty odd years use of sulphur sprays. In the last six



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or seven years the same thing has been the greatest one factor which is bringing Eastern orchards up to the standard of the much and justly famed Western orchards, and should the Western orchardist forget what he owes to the sulphur sprays, just that soon he stands aside while the East passes him on the way to market with high grade fruit.

The economy of soluble sulphur is apparent—100 pounds being equal in effective value to 57 gallons of 33 degrees lime-sulphur solution. As to efficiency—results count for more than far fetched theories. Having been under the closest investigation for three years, we find it used exclusively on many large orchards of two or three hundred acres. The equivalent of 15,000 barrels of solution being used out of the Eastern factories in 1913. In point of convenience, the elimination of the heavy barrel with high freight and haulage expense, the leakage, freezing and crystallization, are all elements which any fruit grower will appreciate. Scientific investigation is always slow. Results in practical work count. Progressive spray manufacturers employing the best chemical engineers obtainable, and the progressive fruit growers bent upon results, co-operating with the experiment stations with their equipment for research work, are right along bringing efficiency up to the minute. Soluble sulphur is tree spray efficiency up to the minute. The combination of the materials for spray purposes and the progress of making are recognized as new and valuable, after the most thorough investigation by the United States and Canadian patent offices and letters patent have been issued. Neither the discovery of the elements nor the fact that they would combine and form a soluble material is claimed, but the obstacles which have heretofore halted previous efforts to produce in a practical way a practical spray have been overcome by the invention of soluble sulphur compound. In working out this combination and process chemical engineers of high standing have been employed and thousands of dollars expended in experimental work. The fruit grower is the one benefited, and to him we look for recognition which real merit deserves.

Spring Time for Road Work

It is a great mistake to put off working roads until August or September, according to road experts of the United States Department of Agriculture. The roads should be worked when the soil is damp so as to make the soil bake when it dries out. If the roads are worked when they are dry, it takes more power to draw the machine and besides dry earth and dust retain moisture and quickly rut after rains. The use of clods, sods, weeds or vegetable matter in building earth roads should be avoided because they also retain moisture. If the working of



Band with Tree Tanglefoot!

Will not injure trees. Easily applied with wooden paddle. One pound makes about 10 lineal feet of band. One application remains sticky 3 months and longer—outlasting 10 to 20 times any other substance. Works alike, rain or shine. Won't soften—won't run or melt, yet always elastic, expanding with growth of tree. No mixing—simply open can and use.

Band Trees About Two Weeks Before Insects Appear and Get Best Results

Especially recommended for Gypsy, Brown-tail and Tussock Caterpillars, Canker Worms, Climbing Cut Worms and Ants, although equally effective against any crawling insect on shade, fruit or ornamental trees.

For Tree Surgery

Tree Tanglefoot is superior to anything on the market—it is better than grafting wax. It will water-proof the crotch of a tree, or a cavity or wound in a tree where nothing else will do it.

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1-lb. cans 30c; 3-lb. cans 85c; 10-lb. cans \$2.65; 20-lb. cans \$4.80.

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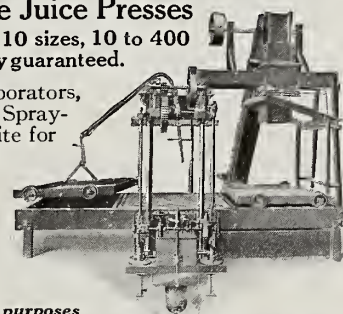
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FRUIT GROWERS, YOUR ATTENTION

Royal Ann, Bing and Lambert cherry trees; Spitzenberg and Newtown apple trees; Bartlett, Anjou and Comice pears, and other varieties of fruit trees.

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Ground Phosphate Rock

The Natural Plant Food and Permanent Soil Builder

1,000 pounds per acre once in each four years will cost about \$1.00 per acre per year. At Pennsylvania State College \$1.05 invested in Rock Phosphate gave increased yields of \$5.85—over 500%. At Maryland Experiment Station \$1.96½ gave \$22.11—over 1,000%. At Ohio Station each dollar paid for itself and gave \$5.68 profit. At Illinois Station \$2.50 gave the same return as \$250 invested in land.

Each ton contains 280 pounds of phosphorous, not rendered available artificially by high-priced destructive acids, but so finely ground as to become available in nature's own way.

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WRITE FOR LITERATURE

"Perfection of fineness in grinding," our motto

THE K. HAND-POWER STUMP PULLER



This picture shows a man pulling a fir stump, 22 inches in diameter at the cut, out of hard ground with the K. Hand-Power Stump Puller. The machine weighs 171 pounds.

A woman can pull more with this machine without any blocks than any team of horses in the state can pull without blocks. A man can pull more with this machine than any horse on any horse stump puller made. These statements guaranteed. The machine is guaranteed for one year.

Reference, National Bank of Commerce, Seattle, Washington.

Kitsap County Commissioners are using these machines for road clearing. Skagit County Commissioners are also using them. The British Columbia Government is also using them.

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Diamond Mixed Fertilizers

Diamond FERTILIZERS are all Fertilizer; the base is bone meal and tankage; to which is added the necessary nitrate, potash and phosphoric acid. The guaranteed analysis is on every bag. No sand or cheap filler is used.

We carry large stocks of Potash, Nitrate of Soda, Phosphoric Acid, Bone Meal, Lime, Land Plaster, Bone Tankage, Blood and can make prompt deliveries at right prices.

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Our Fertilizer Book tells how and when to apply; gives analysis of fertilizing materials, crop requirements and market values. It is a dependable reference book which every grower should have. Send us your name and receive this book, together with the valuable booklets "Potash Pays" and "Plant Food," published by the GERMAN KALI WORKS. Ask for Book No. 205.

Portland



Seed Co.

PORTLAND

OREGON

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

the roads is deferred until the latter part of the summer when the surface is baked dry and hard, they are not only difficult to work, but the work is unsatisfactory when done. Earth which is loose and dry will remain dusty as long as the dry weather lasts, and then turn to mud as the rains begin. By using the road machine in the spring while the soil is soft and damp, the surface is more easily shaped and soon packs down into a dry hard crust which is less liable to become dusty in summer and muddy in winter.

Repairs to roads should be made when needed and not once a year after crops are laid by. Because of its simplicity, efficiency, and cheapness, the split-log drag or some similar device is destined to come into more and more general use. With the drag properly built and its use well understood, the maintenance of earth and gravel roads become a simple and inexpensive matter. Care should be taken to make the log so light that one man can lift it with ease, as a light drag can be drawn by two medium sized horses and responds more readily to various methods of hitching and the shifting position of the operator than a heavier one. The best material for the drag is a dry cedar log, though elm, walnut, box elder or soft maple are excellent. Oak, hickory or ash are too heavy. The log should be from seven to ten feet long, and from eight to ten inches in diameter. It should be split carefully as near the center as possible and the heaviest and best slab chosen for the front. When the soil is moist, but not sticky, the drag does the best work. As the soil in the field will bake if plowed wet, so the road will bake if the drag is used on it when it is wet. If the roadway is full of holes or badly rutted the drag should be used once when the road is soft and slushy. The earth road can best be crowned and ditched with a road machine and not with picks and shovels, scoops, and plows. One road machine with a suitable power and operator will do the work of many men with picks and shovels, and in addition will do it better. If the road is composed of fine clay or soil it will sometimes pay to resurface it with top soil from an adjacent field, which has sand or gravel mixed with it. This method, called the "top soil method," is now in successful use in Clarke County, Georgia.

Storm water should be disposed of before it has had time to penetrate deeply into the surface of the road. This can be done by giving the road a crown or slope from the center to the sides. For an earth road which is 24 feet wide the center should be not less than six inches nor more than twelve inches higher than the outer edges of the shoulder. The narrow road which is high in the middle will become rutted almost as quickly as one which is too flat, for the reason that on a narrow road all the traffic is forced to use only a narrow strip. Shoulders are often formed on both sides of the road, which prevents

storm water from flowing into the side ditches, retaining it in the ruts and softening the roadway. These ruts and shoulders can be entirely eliminated with the road machine or split-log drag. The width of the earth road will depend on the traffic. As a rule, 25 or 30 feet from ditch to ditch is sufficient if the road is properly crowned. Ordinarily the only ditches needed are those made with the road machine which are wide and shallow. Deep narrow ditches wash rapidly, especially on steep slopes. The earth road should not be loosened, dug up, or plowed up any more than is absolutely necessary. It should be gradually raised, not lowered; hardened, not softened.

Boys' and Girls' Club

The State Department of Education with the aid of the Oregon Agricultural College has planned to organize in every school district a boys' and girls' industrial club. We are now publishing a bulletin giving full details of the plan, and shall take pleasure in sending you a copy as soon as it is off the press. Each club is expected to take up one or more of the projects named below, the choice of the project depending upon the work which is of greatest interest to the community in which the club is organized. The following are the Industrial Club projects suggested by this department for this year: (1) Boys' Corn Growing Contest, (2) Boys' Potato Growing Contest, (3) Girls' Canning Contest, (4) Girls' Cooking and Baking Contest, (5) Boys' and Girls' Poultry Contest, (6) Girls' Sewing Contest, (7) Boys' Pig Feeding Contest, (8) Boys' and Girls' Gardening Contest, (9) Dairy Herd and Management, (10) Manual Arts Contest.

The Agricultural College has promised to assist us further in preparing bulletins giving expert advice to the children as to how best to produce the different things named in these projects, such as bulletins on potato growing, etc. These will be distributed through the clubs, and will be of value to parents as well as to the children. The work of organizing the clubs will fall largely upon the county school superintendents working through the



This Hood River Apple Storage House
IS INSULATED WITH

Cabot's Insulating "Quilt"

at the lowest cost and with the greatest efficiency and permanence. Quilt is made of eel-grass, the fiber that will not rot, will not burn, will not harbor insects or vermin. It makes a thick cushion of dead air spaces that keeps out heat better than other insulators that cost much more and that are not permanent, sanitary or safe. One layer of Quilt is equal in insulating power (by actual test) to forty or fifty layers of common building paper. It is easy to apply, low priced and never goes to pieces in the work.

Send for sample of Quilt, with catalog and prices, to

SAMUEL CABOT, Inc., Manufacturing Chemists, Boston, Mass.

or to the Northwest Distributors:

S. W. R. DALLY, Globe Building, Seattle

TIMMS, CRESS & CO., Portland

Conservo Wood Preservative—preserves posts, planks and all other timbers
Cabot's Creosote Stains—for shingles, siding and other outside finish

The Schellenger Fruit Sorting Machine *Will Increase Your Profits*

The fruit packing problem, formerly difficult and expensive, is made easy and cheap by use of the *Schellenger Fruit Sorting Machine* which fully meets every requirement of the most discriminating fruit grower.

Read what it has done for a few of our purchasers.

It will do the same for you:

"Three packers packed on an average of 350 boxes per day. The machine is perfect in every respect and I would not sell it for \$500 if I could not get another. It is a labor and money saver."—John Gerry, Cashmere, Washington.

"It gives us pleasure to recommend this machine to our friends, as it did good work for us and saved both labor and fruit."—McCue & Son, Greenwood, Virginia.

"I can't praise the machine too high. Packers will leave other places and come to the machine when they get the opportunity, so that it is easy for machine owners to get all the help they can use."—Harry I. Shotwell, Wenatchee, Washington.

"I packed 23 cars of apples with eight men in the packing house. Total expense for labor in packing house, including handling, sorting, packing and nailing up, averaged 3½¢ per box."—Ezra V. Steed, Clearfield, Utah.

"The average cost of sorting and packing was 2¢ to 4¢ per box."—Yonah Fruit Co., Cornelia, Georgia.

"Machine very satisfactory and it will do all that is claimed for it. Would not take double the price we paid for it."—Covesville Orchard Co., Covesville, Virginia.

"The machine gave us excellent work and we are much pleased with it."—A. Weed & Son, North Rose, New York.

"Everybody owning a fair sized orchard should have one as they are certainly a labor saver."—Empire Lumber Co., Empire, Mich.

"We are perfectly satisfied with the work done."—Oka Agricultural Institute, La Trappe, Quebec.

Mail this coupon today for free catalogue.

SCHELLENGER FRUIT SORTING MACHINE CO.,
608-611 S. Paulina St., Chicago, Illinois

You may send me one of your free catalogues.

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No. 190
Horizontal
50-gallon

THE RIGHT KIND OF SPRAYER

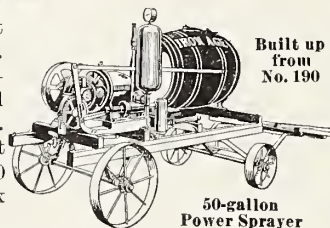
Means the one that just fits your purpose. You need to consider capacity, pump, engine, pressure, mixing, straining sediment, stability on hillsides, using your own wagon, engine or sprayer with balance of the outfit to fit what you already have. Get the right sprayer for YOUR work and you won't have any cause to be dissatisfied. We show here but three of the 70.

IRON AGE

Bucket, Knapsack,
Barrel, Power and
Traction Sprayers

They are built up in units so that you can buy what you need now and add to the outfit later if necessary. All have the best pumps in use on any sprayers—least slippage among eight of the best in a disinterested test. Solutions touch only brass or galvanized parts. Hemp packing, bronze ball valves, both easy to get at. Pumps outside. Power sprayers are 50, 100, 150 or 200 gallons capacity. 200 pounds pressure with six to eight nozzles.

Ask your local dealer about this line and write us for our new "Spray" book, spray information and copy of Iron Age Farm and Garden News



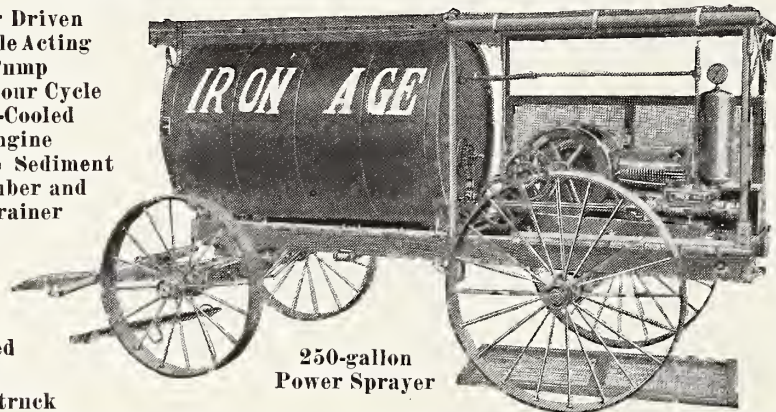
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No. 190

50-gallon
Power Sprayer

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Gear Driven
Double Acting
Pump
2 H. Four Cycle
Air-Cooled
Engine
Outside Sediment
Chamber and
Strainer



Furnished
with or
without truck

250-gallon
Power Sprayer

teachers. The University of Oregon, the Oregon Agricultural College, and the Oregon Normal School have promised to send out men in addition to the field workers from this office to help the superintendents in this work.

The State Fair Board has appropriated to this department \$1,000 to be distributed among the boys and girls as prizes at the state fair. The board has also promised us \$500 to be used to entertain two boys from each county for the whole week of the fair. The boys will be under the most careful supervision and will make a study of every department of the fair, including especially the poultry and the stock judging. In addition to this we expect to send the ten children who stand highest in the state contest to the Panama exposition at San Francisco. Information regarding any phase of this subject can be had by addressing J. A. Churchill, Superintendent of Public Instruction, Salem, Oregon.

The Red Spider and Mites

The red spider is not an insect, but a mite. It sometimes is reddish in color, hence the name, but it is often brownish or greenish-yellow. There are red spiders of the orchard, of hops, or raspberries and strawberries, of greenhouse plants, etc., as well as of grass and shade trees, like locust and cottonwood. The true red spider passes the winter in the ground in a partly grown condition. Other red spiders, like the clover mite or orchard mite, lay thick shelled but microscopic winter eggs on the bark of the plants they infest. Often the eggs are so numerous on certain twigs of orchard trees as to give a red color to the bark. Such eggs are generally resistant to spray. Sulphur-lime has but little effect on them, but the black-leaf spray destroys many.

All mites are susceptible to sulphur. Plain cold water has also a detrimental effect on their growth. Summer sprays containing sulphur, such as weak sulphur-lime (one part of concentrate with thirty parts of water) or sulphurated kerosene emulsion, work well in checking either the brown mites or red spiders. In making the kerosene emulsion add one pound of sulphur to each gallon of kerosene used. A common formula is to add sulphur to soap solution (15 pounds sulphur, and 2 pounds whale-oil soap to a barrel of water). Instead of soap as a sticker flour-paste is sometimes used. Sulphur may be mixed with the paste and added to weak sulphur-lime. Simply dusting sulphur into the trees is effective in summer time.

Blackleaf tobacco extract is very dependable. It may be used one part to seventy-five, or the stronger Blackleaf 40 may be mixed one to eight hundred of water. It would be well to add this to the whale-oil soap and sulphur spray. A simple treatment that often proves entirely effective is to turn a garden hose on the infested plants. Where this is impossible a stream from

MORE AND FINER FRUIT

IS WHAT EVERY FRUIT RAISER IS STRIVING FOR

Nitrate of Soda

is the best and cheapest fertilizer that is possible to obtain for the orchard. The fifteen per cent nitrogen (the most important element necessary to successful growths) contained in Nitrate of Soda is immediately available, which makes it DIFFERENT AND BETTER THAN ANY OTHER FERTILIZER.

Used as a spray as well as fertilizer.

Enriches the soil, makes trees strong and healthy, the fruit ripens more quickly—AND IT'S BETTER FRUIT.

We have reliable literature bearing out every statement we make in behalf of Nitrate of Soda, which we want to send you free. Write

Nitrate Agencies Co.

LEARY BUILDING

SEATTLE



Absolutely Waterproof

TOWER'S FISH BRAND REFLEX SLICKER

does not absorb water—it turns it off! Wear it when you work in the wet and know the true meaning of wet weather comfort.

\$3.00 AT YOUR DEALER'S
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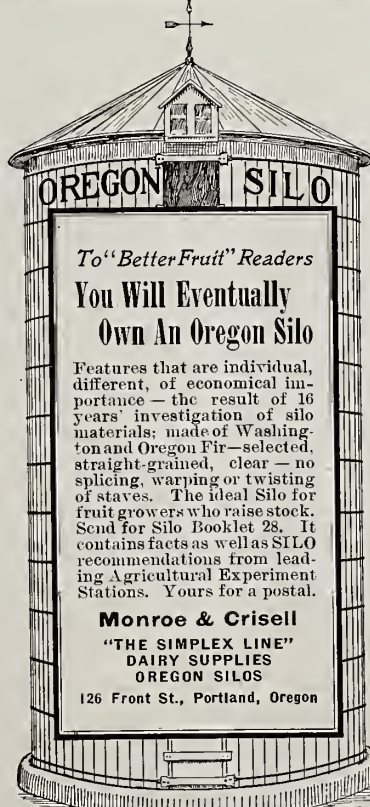
\$15.00 per 100 lbs.

The clover we are offering is of the very best quality and complies with all the state laws. As a special inducement to growers of Hood River we will deliver it free in 100-lb. lots or more.

Fancy Vetch for \$3.00 per 100 lbs., or \$55.00 per ton, f.o.b. Salem, Oregon.

Place your orders now.

D. A. White & Sons
SEEDSMEN
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To "Better Fruit" Readers
You Will Eventually Own An Oregon Silo

Features that are individual, different, of economical importance—the result of 16 years' investigation of silo materials; made of Washington and Oregon Fir—selected, straight-grained, clear—no splicing, warping or twisting of staves. The ideal Silo for fruit growers who raise stock. Send for Silo Booklet 28. It contains facts as well as SILO recommendations from leading Agricultural Experiment Stations. Yours for a postal.

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DAIRY SUPPLIES
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 126 Front St., Portland, Oregon

the spray pump may be employed. For the red spiders of the greenhouse, sulphur is commonly placed on the heating pipes. The fumes given off prevent the development of the mites.

—A. L. Melander, Entomologist.

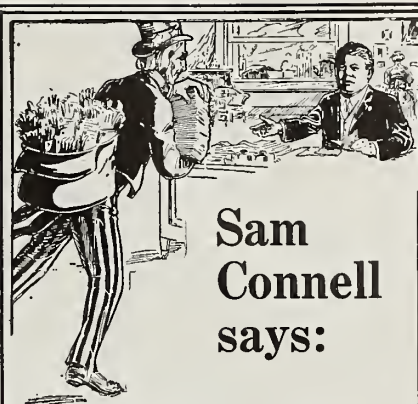
Cut Worms

Much damage to young orchards is done by climbing cut worms. These insects eat the buds and young foliage only during the night time. During the day they hide at the base of the tree, going down a few inches into the soil. The State Experiment Station of Washington recommends as the best treatment for this pest to scatter a poisoned bait, a spoonful to a tree. This is made by mixing dry 1 pound of paris green to 20 pounds of bran, then adding one or two quarts of molasses and if possible the same amount of old beer. Work up with enough water to make a stiff mash before placing over the orchard. Do not let chickens have access to this poisoned bran.

As a supplement to this treatment spray the trees with bordeaux made as follows: 5 pounds of blue stone dissolved in 25 gallons of water and 5 pounds of lime slaked in 25 gallons of water. Mix the two. The same scheme of treatment will answer for the garden cut worms. If the poisoned bait be distributed before you set your plants or sow your seed you can work out the cut worms from the garden. After the plants have come up the bordeaux spray will help to protect them. Tying bands of cotton around the tree trunks or painting with tangle-foot or axle grease; or fastening collars of tin or paper around the trunks are remedies that will not answer for our climbing cut worms. There are several other insects which feed on buds, foliage and garden produce which may not be killed by this treatment.

Nitrate of Soda

While the soil of the Northwest is unusually productive, experts have noticed that it has not given as great returns as it is capable of giving. Investigation has shown frequently that this is due to lack of nitrogen, which is one of the necessary plant foods. Occasionally some soils are deficient in potash or may be deficient in phosphorous. It is true that nitrogen and humus become more quickly exhausted than almost any of the other soil ingredients. Plants and trees show a lack of nitrogen by the color of the foliage and also by the lack of proper growth. Nitrogen can be supplied through the soil by manure, by cover crops or by the use of nitrate of soda. Nitrate of soda is very quick in action and therefore is used by gardeners and small fruit growers more extensively than almost any



Sam Connell says:

"It's the volume of business Uncle Sam gets for me, and the elimination of expensive traveling men and middlemen that reduces the cost of your material"

—Uncle Sam delivers your orders to me personally—they receive my personal attention in every step of manufacture—you are rendered prompt service—are given the savings attendant on superior manufacturing methods—reduced distribution costs, less the middleman's profit—worth saving, isn't it? Drop a post card and Uncle Sam will bring the proofs at once—doesn't obligate you in the least.

Mill Material—
Doors, Sash,
Everything
for the House,
Barn or Garage
at Factory Prices

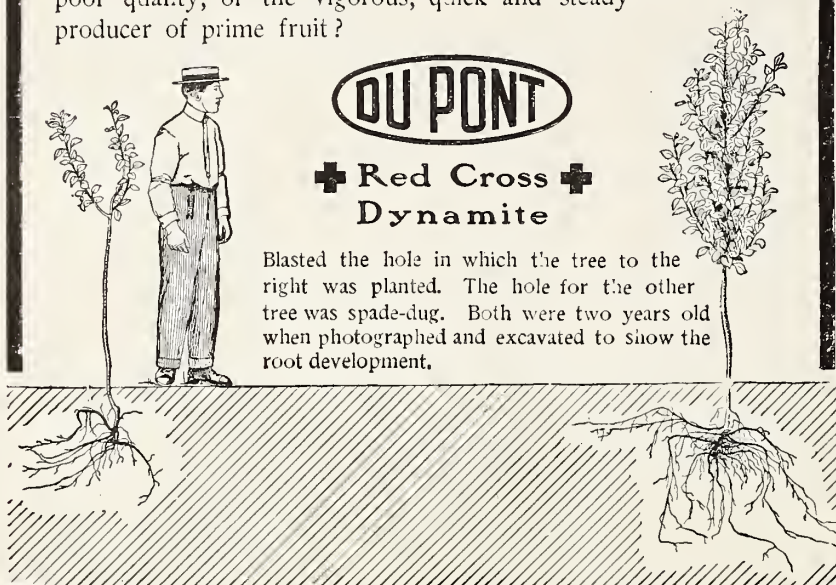
Writes in your own language; we have an interpreter.

SAM CONNELL, Manager

Northwest Door Company
Portland, Oregon

Which Tree Do You Want?

The slow-grower, with few and shallow roots and fruit of poor quality, or the vigorous, quick and steady producer of prime fruit?



Blasted the hole in which the tree to the right was planted. The hole for the other tree was spade-dug. Both were two years old when photographed and excavated to show the root development.

THE ROOTS TELL THE REASON WHY

Dynamite set trees bear fruit one year earlier. Write for Farmer's Handbook No. 29 F, and learn how to stop first year losses and get quick profits.

BLASTERS WANTED

Many farmers prefer to hire blasters. Demand exceeds supply. Reliable men taught free and helped to get work. \$200 capital needed. Write for free booklet No. 29 B.

Du Pont Powder Co.

Maynard Building

SEATTLE, WASH.

To STRAWBERRY GROWERS

"Increased My Strawberry Crop 35 per cent to 40 per cent the Second Year"

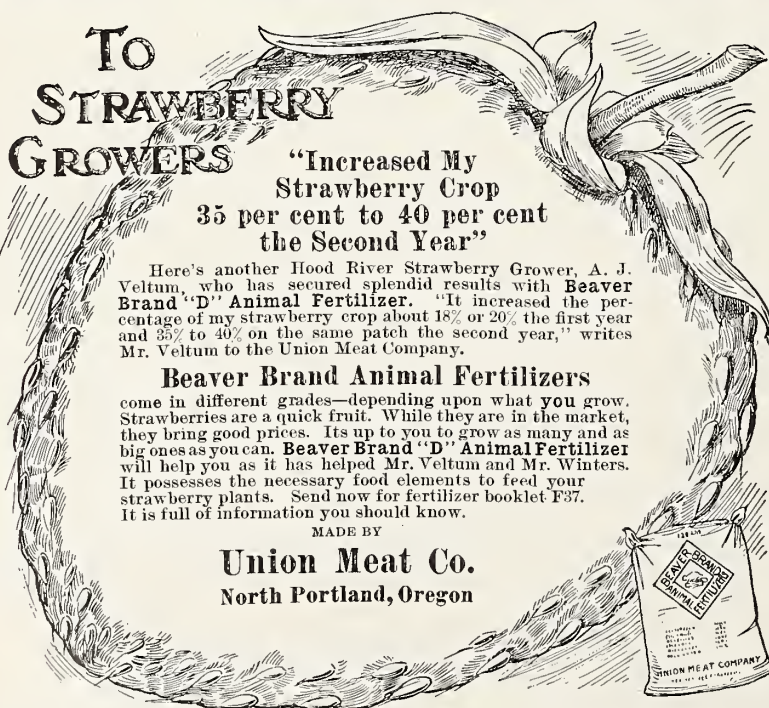
Here's another Hood River Strawberry Grower, A. J. Veltum, who has secured splendid results with **Beaver Brand "D" Animal Fertilizer**. "It increased the percentage of my strawberry crop about 18% or 20% the first year and 35% to 40% on the same patch the second year," writes Mr. Veltum to the Union Meat Company.

Beaver Brand Animal Fertilizers

come in different grades—depending upon what you grow. Strawberries are a quick fruit. While they are in the market, they bring good prices. It's up to you to grow as many and as big ones as you can. **Beaver Brand "D" Animal Fertilizer** will help you as it has helped Mr. Veltum and Mr. Winters. It possesses the necessary food elements to feed your strawberry plants. Send now for fertilizer booklet F37. It is full of information you should know.

MADE BY

Union Meat Co.
North Portland, Oregon



other chemical fertilizer. The nitrate of soda comes from Chili and can be purchased from any of the dealers handling fertilizers. Splendid results have been obtained by the use of nitrate as evidenced in the color, quality and size of fruits. The results in strawberries by the proper use of nitrate at the right time are certainly wonderful. Nitrate should be applied to the strawberry field just as the plants come into blossom.

The Pacific Fruit Express

"Nick" Whitehead, formerly chief clerk under S. A. Hering when he was district manager of the Pacific Fruit Express, has been appointed district agent for the Northwest territory, with headquarters in the Fenton Building, Portland. Mr. Whitehead is now district manager for the Company at Sacramento, California. The change becomes effective January 1. Since Mr. Hering became car service agent for the O. W. R. & N. six months ago, O. B. Hughes has been acting district manager. The appointment of Mr. Whitehead, it is understood, does not affect any of the subordinate officials. The Portland office of the express company is rated one of the most important in the country and it was largely because of Mr. Whitehead's experience in this territory before he went to Sacramento that he was chosen to fill the six months old vacancy.

P. P. Dawson, who formerly raised tobacco in Virginia, intends to cultivate a crop of the nicotine weed at Weiser, Idaho, this year. He conducted experiments there a few years ago and met with unusual success. It is a crop which, under successful cultivation, yields between \$90 and \$200 an acre. Other experiments will be made on lands of the new Crane Creek irrigation project where Mr. Dawson says conditions are particularly adapted to tobacco cultivation. He insists that the crop can be produced with profit in many other parts of Idaho and he hopes to demonstrate that it can be produced as successfully here as in Virginia.

More diversified farming is the crying need of the Northwest according to President Keller of the Weiser (Idaho) Commercial Club, in a recent statement. Farmers of that section are taking hold of the idea and have already accomplished some remarkable results with corn and many other products. Planted between the rows of trees in his young orchard at Weiser, as an experiment, August Brockman raised four acres of white beans this last season and realized more than \$45 an acre for the crop. This more than paid expenses of cultivating the orchard and left him a substantial profit besides.



Trade Mark

Buy "Corona Dry"

One pound of "Corona Dry" will do the work of three pounds of Paste Arsenate and do it better

Imitated but not duplicated

But economy is not everything. Efficiency is more important. What would it mean to you to have a spray mixture of standard strength and be absolutely sure that all of one spraying or of many sprayings was absolutely the same strength? Evaporation, difficulty of perfect mixing, make this impossible with a paste arsenate. You can have a standard efficiency if you use *Corona Dry*.

Largest and most progressive growers have rendered the verdict

A large practical usage in every section of the country has proved that "Corona Dry" is unequalled in efficiency or as "easy mixing." It does not freeze, dry out or cake; always retains its original strength. A perfect mixture, a perfect standard of unvarying strength is assured with

"CORONA DRY"

Arsenate of Lead

Patented June 30, 1913

The "Standard" for Convenience, Economy, Efficiency

Quickly and easily mixed. No working up—no straining needed—no sediment. No lumps. No waste. Never clogs spray nozzle. Highest per cent. of actual killing power. Absolutely safe, will not burn. Sold in net weight packages: 200 lbs., 100 lbs., 50 lbs., 25 lbs., 5 lbs., 1 lb. No shrinkage, seepage, evaporation. Every package contains actual net weight of "Corona Dry" paid for. Remember, "Corona Dry" means no guesswork, but a standardized spray in which the mixture is always the same strength and efficiency

Write for Booklet. Ask for Corona "Tree Insurance" Policy. Address

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Insecticides and Fungicides, Arsenate of Lead, Lime and Sulphur, Bordeaux Mixture, Paris Green, Etc.

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Northwestern Sales Agents **Portland Seed Co., Portland, Oregon** **Catalogs and prices on request**

Marketing of Fruits from Merchants' Standpoint

By A. H. Averill, President Portland (Oregon) Chamber of Commerce

THE merchant's duty in marketing fruit is, in some aspects at least, still an open question. That the average business man of any progressive city will readily seize an opportunity to aid in moving fruit between the producer and the consumer must be conceded; but there are a multitude of conditions that inevitably attend working out any plan whereby a mercantile community organizes itself or allies with growers, to quicken, cheapen and strengthen the fruit movement. In the first place, we have brilliant examples of success where private interests, working for direct profit, have developed fruit industries. I need refer to no more than one of this class, the United Fruit Company, handling the banana product of certain Southern territory. Again, we have notable examples of co-operative work, where harmony of purpose blended with wise

management is to protect the grower, secure the most economical handling, the cheapest transportation and get the fruit to the consumer at a low cost.

There are deep students of human nature who believe in the inherent strength of the business principle which rewards a man directly for what he does and deprives him of returns when he fails to conform to the fundamentals. There are others who believe that the supreme effort of the individual is attained when he is not working so directly for himself, but has in his plan of human effort a sort of altruistic scheme or thought. It is apparent that both these views have precedents for their support. But it also seems apparent that the scheme of business as developed by modern society requires a certain relationship between these two primal principles. Certainly in the fruit business of the Northwest, I feel that the time has come when we must unite something of the direct business incentive with the principles of altruistic effort, as evidenced in associated work. Speaking for the Chamber of Commerce, which embraces a large number of the merchants and business men of Portland, I do not hesitate to say to you that Portland recognizes the

necessity of improving the existing order. By this I mean that the Chamber and the business men of Portland are ready to do whatever is in their power to strengthen the fruit industry. In extending this aid, it is clear that a system will have to be developed which will eliminate many difficulties now confronted, and which have made many fruitgrowers of the Northwest despair. How to extend this help is a serious problem with us, one with which we have labored for months, and which is to be worked out immediately.

Business men and merchants cannot take the fruit away from the grower by force and have it offered to the world's consumers. Business men of this city cannot with success develop

GOOD POULTRY

Devoted to intensive farming with Poultry as the chief working basis. Three months work in the poultry yard for 10c
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Saugatuck, Michigan

Vehicles and Agricultural Implements

THE BEST OF
ORCHARD AND GARDEN TOOLS
A SPECIALTY

Gilbert Implement Co.
HOOD RIVER, OREGON

JUDICIOUS SPRAYING IS AN EFFECTIVE FRUIT INSURANCE

P-W-R LEAD ARSENATE P-W-R

SUPPLIED BY WHOLESALE DRUGGISTS AND DEALERS THROUGHOUT THE UNITED STATES

POWERS-WEIGHTMAN-ROSENCARTEN CO.

Manufacturing Chemists

Founded 1818

NEW YORK PHILADELPHIA SAINT LOUIS

a combine here from which the grower is excluded, for that would lead to the bitterest ultimate conflict. There seems but one avenue for effort open to us: That is to get together in Portland, make plans for the maximum facilities in handling such fruit as may be sent to the consumer through this city and port and give the strength of this business community to whatever work may be conducted beyond the city limits in getting the growers to co-operate. This brings us quickly to the orchard. There our opportunity is limited by the spirit of the man producing the fruit. If he realizes deeply the gravity of the existing situation, and has studied the avenues of relief so thoroughly that he is ready to give a helping hand to any intelligent plan, the whole problem will not be long in solution. We have al-

ready taken the first steps. The Chamber has declared for whatever effort may be made here to compel recognition of the new and most economical traffic route. In addition, it has committed itself and this business community to persistent work in whatever direction may be needed to perfect more economies in handling and marketing fruit. Committees have been named to work out the preliminary phases of the movement. In due time they will present a plan for an association or league which will invite the membership of both the local business man and the grower. This organization must take up a multitude of details, looking to a broader market. It will be the duty of this body to prove to the producer and consumer that the Northwestern apple may be made to reach all parts of the world at a figure which will insure its consumption by the masses of the people rather than by those who indulge in luxuries.

In our preliminary studies we have revealed conditions which are alarming unless there is induced immediately an improved condition. That the Panama Canal would be the source of this hope we have all believed for years. But when the Chamber, a few months ago, began estimating the fruit tonnage which could be expected to move through this port to the world markets via the Panama Canal, it was amazed to learn that no plans whatever had been made to ship apples through Portland. But one of the big Northwestern agencies, the Northwestern Fruit Exchange, maintained an office here, and it was confronted with local and prospective steamship rates which satisfied the management that unless there was a change no apples to speak of would pass through Portland. We learn that the acreage planted to apples in the three Northwestern States is from 370,000 to 400,000 acres. Of this total, it is declared by Mr. C. A. Malboeuf, whom the Chamber has asked to prepare an exhaustive statement on orchard, transportation and other conditions, that not to exceed an average of twenty per cent of this total is in present bearing, and a part of this is not yet near maturity. With a reported crop of 15,000 carloads in the three states last year, 10,000 or 11,000 carloads this year, and an estimated crop

of 20,000 to 25,000 carloads the coming year, the earnings of the grower have been unsatisfactory. All local men who have orchard investments are eager to see established conditions which will safeguard them against violent annual fluctuations in market prices and permit them to go about their orchard work with the certainty that guides other business enterprises. What will happen when there is produced each year in these three states 60,000 carloads or more? We will have to secure a broader market. To do this at a living figure for the orchard owner, the whole range of charges must be gone over with a fine-toothed comb and

Virginia Apple Orchards

frequently net as much as \$500 an acre from one crop. Peaches, pears, plums and small fruit do equally well. Ideal climate for fruit-growing. Good, well located fruit lands, on railroad, can be bought as low as \$15 an acre on easy payments. Write today for particulars. F. H. LAHAUME, Agricultural Agent, Norfolk & Western Ry., Room 28 N. & W. Bldg., Roanoke, Va.



Where Men of Ambition Prosper

NOWHERE is ambition rewarded more generously than in the Southeast. Small capital and energy will accomplish wonderful results for you in this favored land.

Dairying, trucking, fruit growing, poultry raising and general farming are making Southern farmers independent.

Land from \$15 an Acre Up

Plenty of rain and ample sunshine every month, irrigation unnecessary. Growing season from 7 to 10 months duration. Two and three crops raised annually. Local markets plentiful and profitable. Early vegetables and fruit bring high prices in Northern cities.

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Send for the "Southern Field" magazine, booklets and farm lists which give the whole facts.

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"Star" Orchard Ladder

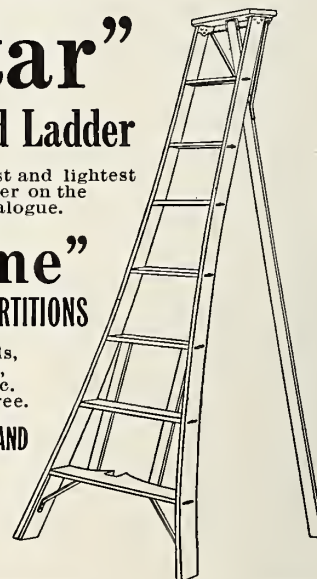
The strongest and lightest orchard ladder on the market. Catalogue.

"Acme" ROLLING PARTITIONS

For schools, churches, homes, etc. Booklet Free.

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CALIFORNIA



Store Your Apples in Spokane

The Natural Storage Center

Take advantage of storage in transit rate and the better market later. Write us for our dry and cold storage rate and information.

Ryan & Newton Company
Spokane, Washington

every unnecessary element cut away. All of this must be done intelligently, so as not to destroy any necessary intermediate agency, which would react in enhancing the very charges which are attacked.

In determining what the Panama Canal route may accommodate, we find first that all the experts with barely any exception, believe refrigeration while passing through the Southern clime will be necessary. We have next the local rate from the orchard to tide-water and the handling from the car to the steamship at this or other sea-board point. In respect to Atlantic States consumption this local handling is a disadvantage, but in respect to the European shipments the Pacific port must face no more handling than New York's route. We find now that no organized force is busy in the endeavor to profit by the great economic opening brought to our door by the canal. Our expectations have no more assurance of realization, so far as fruit is concerned, than two or three years past.

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much of a tax upon our people to sustain the maximum production of the orchards. The Chamber will soon invite you fruit men to join in the great work. All elements must be united to make it a full success. We must have dock and warehouse facilities at the seaboard suited to your requirements. We want to know what they are and have already been assured by the Commission of Public Docks in Portland that in the work it is authorized to do all possible provision will be made to take care of a business assured to come here. We must have the co-operative unit in the many communities, which may deal effectively with the great selling and buying agencies. We must have a broad market for fruit by-products, for the canned and dried article and for other fresh fruit than the apple. If all of us give this great subject deep thought for the coming years, the time will be richly repaid. Our merchants and financial men are willing to do a most important part.

So far as Portland and the Chamber are concerned, our plan will extend to all that territory which may find it, under favorable conditions, most profitable to seek world markets by steamships entering this harbor. We have here advantages given by nature which insure more economical transportation for a great area of the Northwest than can be found through any other seaport. The producers of all the area so dependent upon this port are entitled to get the maximum benefit from its use. To that extent our interests are in common, and to that extent there should be no hesitation in the fullest co-operation. If nature permits the export of fruit through this port at a less cost than through any other, we feel that we are derelict in our duty to ourselves and to the producers of all our territory if we do not make fair use of the advantage. On behalf of the Chamber of Commerce, I wish to urge the orchard owners of this state to prepare for greater things. They will not come from the mere wishing. We must work for them, and we are submitting to you a plan which appeals to us as the most likely to insure greatest results. Meet us in the same spirit, amend our plan as may be found necessary, but join with us in a most determined struggle to sustain our Northwestern fruit industry on a comfortable, profitable basis.

Insect Pests and Diseases, Etc.

Continued from last issue

As soon as most of the petals have fallen from the trees, it is time to get after codling moth, and also time for the second spraying for scab, and for any aphid which has not been killed. Use arsenate of lead paste, 4 pounds to 100 gallons of water, for codling moth; and where scab is present add atomic sulphur, 12 pounds to each 100 gallons of water; and in case aphid is present add Black Leaf-40 at the rate of 1 to 1,000. If no scab is present, and it is desired to spray only for codling moth and aphid, the atomic sulphur may be

omitted, but a dilute distillate oil emulsion (three per cent) or animal oil soap (such as whale oil soap) should be added as a spreader for the nicotine. If atomic sulphur is used the soap is not necessary. All spraying to be done under high pressure and every calyx cup filled. Use tower platform to enable one man to spray from above, and cover all portions not thoroughly sprayed from the ground. If some of the work is duplicated all the better.

If this spraying is thoroughly done, the second spraying for codling moth should be applied about three weeks after the petals fall from the trees, and if the scab has been present add atomic sulphur, which, in addition to its value as a fungicide, will catch any red spider or mites that may be present. All of the aphids, both the green and purple aphids, should have been killed prior to this time. The third spraying for codling moth should be applied about ten weeks after the petals fall. This can be definitely known for each section by collecting a number of first-brood worms and allowing them to pupate among rags or paper in a cage suspended in the tree, or kept in the shade on the ground. Spray when the first moths emerge in the cage, as young worms will begin entering the fruit within a week to ten days after the moths begin flying. If red spider or mites are present add atomic sulphur to arsenate of lead.

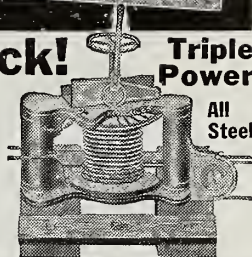
These recommendations consist of five sprayings each year in sections or orchards where all of the troubles mentioned are serious. This schedule, if followed closely and carefully, will be effective in any apple-growing section west of the Rocky Mountains. If you have no scale or aphids, omit the dormant spraying with lime-sulphur or crude oil. If you have no scab or mildew, it will not be necessary to use a fungicide with the codling moth treatment. If no aphids is present, the nicotine and oil emulsion or soap solutions may be omitted. If neither scab nor aphids are present and you have only scale insects and codling moth, apply the winter treatment of either crude oil emulsion or lime-sulphur solution and then spray for codling moth when the time comes. As to the number of applications, the writer desires to go on record as favoring three sprayings each year for codling moth in most sections of the United States. I do it in my own place every year and believe it pays. In case of Bartlett pears and early apples two applications may suffice, but with fall and winter apples the third application is advantageous nine years out of ten.

One other warning: Do not combine lime-sulphur solution with any brand of standard arsenate of lead. If this combination is desired, use a neutral lead. Neither is it advisable to combine bordeaux mixture and nicotine preparations. Both combinations are liable to cause injury to the fruit and foliage. When a sulphur fungicide is desired, some preparation in its pure state, held in suspension but not in

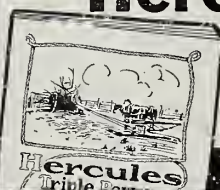


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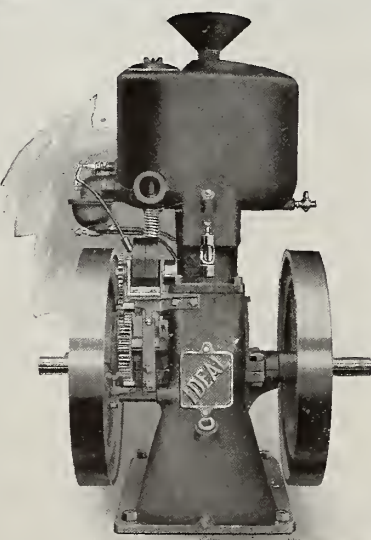
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solution, should be used. Bordeaux mixture and arsenate of lead may be combined and used safely wherever bordeaux can be used alone. Finally, study your orchard and watch its troubles. Watch the trees and prevent the development of diseases and insects. Do not, under any conditions, take chances and trust to luck. Play the game safely every year. Practice economy by making the trees bear heavy crops and make every apple a good one. Remember that a loss of five per cent of your gross returns very often means the difference between profit and loss, when an expenditure of a few dollars per acre, at the right time, would have increased the value of your returns many times over the cost and put a good margin of profit on the right side of the ledger. Spray for codling moth, spray for apple scab, spray for aphids, scale insects and red spiders and mites. All can be easily and efficiently controlled. If you don't know how find out. That is what we are here for.

Odd Facts About Soil

[London Tid Bits]

HOW far does the heat of the full summer's sun penetrate into the ground? Probably no one person in ten will give an answer that is even approximately correct. Their replies generally vary from one inch to many hundreds of feet. Actually, the distance is about three feet. Beyond this depth the temperature of the soil does not vary appreciably from hour to hour, let the midday be never so hot and the midnight never so cold. At this depth the mean temperature in the summer is about 58 degrees Fahrenheit and in the winter about 36 degrees Fahrenheit.

And the annual difference? That is to say, the depth at which there is some difference between the summer temperature and that of the winter? Well, at a depth of sixty feet it is impossible to measure any change due to the changing seasons overhead. Go down only forty feet and it is minute—hardly measurable. But at twenty-five feet to thirty feet it is quite a definite amount.

The surface heat must take a long while to penetrate downward. In fact, curiously enough, the change in temperature of the ground takes just more than six months to reach the end of its twenty-foot journey. Thus we are faced with the phenomenon of midsummer upon the surface occurring at the same time as midwinter twenty-five to thirty feet down, and vice versa.

As most people are aware, the temperature increases with the depth. At three feet down the average annual mean is just short of 45 degrees Fahrenheit, while at twenty-five feet it is just over two degrees more, that is, 47 degrees Fahrenheit.

In agricultural districts you will hear farmers in the same village talking about "cold" soils and "warm" soils. This, although it sounds improbable to those who have never had anything to do with the land, is an actual fact.

Everybody knows, from personal experience, that black cloths are hotter to wear when a hot summer's sun is shining than white ones, hence the "flannels" for men and the white frocks for girls. The reason for this is that black and other dark colors absorb heat, while white and the lighter shades reflect it. And this applies to soils equally with cloths.

Those soils which by their ingredients are a darker color are literally warmer than their lighter neighbors. Peaty soils, some of which are nearly black, others a rich dark brown, are the warmest. Light colored clays and chalk are the coldest. There may be as much as 15 or 16 degrees Fahrenheit between the temperatures of two soils, lying next to each other and upon the same day. On a warm summer's day the temperature of peaty soil may well be over 87 degrees Fahrenheit, while a chalky field of similar situation in the same district will not rise above 73 or 74 degrees Fahrenheit.

Of course, the great advantage of a warm soil is that the crops upon it come to maturity so much earlier than those upon a cold soil. Therefore the man who is cultivating the former is enabled to place his produce upon the market very much sooner than his neighbor who is not so favored by nature.

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Pruning An Apple Orchard

By J. Howard Wright, North Yakima, Washington

A GREAT deal has been said and written on this subject, but much bad practice still prevails. Orchards are seen all through the country which have either never been pruned or, if the work has been performed, it has done more harm than good—trees with trunks trimmed up three times the height they should be or low and sprawling all over the ground, making it impossible for man or horse to get near.

When young trees are dug from the ground, the roots from necessity are more or less bruised or mutilated. All these bruised or torn surfaces should be pared off smoothly with a sharp knife. If left they induce decay and

are unfavorable to the best healthy growth of the tree, in the same way that a broken or bruised limb above ground would furnish a dead stub or make a bad scar, while pruning it smooth will cause it to heal over readily. Thrifty young trees have roots extending as far each way from the foot of the tree as the height of the tree. A careful examination will discover the ground full of very small rootlets close to the surface. It is almost impossible to take the tree up in the nursery without destroying a very large number of these rootlets. Now when the tree is reset it is unable for a time to feed its leaves and branches. A part, therefore, must be cut off to

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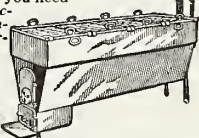
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restore the balance in accordance to the loss of the roots. Another thing must be taken into consideration at this time, and that is the cutting back in order to obtain a low head. The yearling switch should be cut off after planting about eighteen inches from the ground. This will give a head low enough for all practical purposes. Remember that there is a mutual relation between the roots and the leaves. The leaves cannot exist without the moisture received through the roots and the roots cannot grow without the nourishment from the leaves.

The tree is now ready to commence growing. Allow not more than six or seven shoots to grow. The next spring select four or five of the best of the limbs, about equidistant around the trunk of the tree, and also scattered about eight inches up and down. Trim to an outside bud all of the growth except from six to twelve inches, according to the amount of growth that has been made during the previous season. Cutting to an outside bud has a tendency to spread the tree out rather than to grow straight up. As much as possible trim the tree so that the center limbs are a little longer than the outside ones. This will keep these limbs in the lead and the tree will have a rounding top.

At the beginning of the third season cut the limbs back to twelve or fifteen inches, allowing two to each limb of the preceding year, observing the rules in regard to the rounding top. The fourth and following seasons cut all limbs back to eighteen inches, thinning the shoots where they seem to be too thick. On Rome Beauty especially be sure to cut back to this length, else there will be a long limb with a tuft of leaves on the end, which will likely bend over with the weight of the new growth, possibly break off, and give the tree a bad appearance. As a rule fruit spurs do not set along the limb and as a result a part of the tree is barren where the fruit is most wanted. As a general thing all varieties are quite upright in their manner of growth, but there are some, such as the Jonathan, which are more spreading in their growth. These should be cut to inside buds after the third season.

Along in the fourth, fifth and sixth season fruit spurs will begin to bear. Careful attention must be given to the pruning of the tree that these are not cut out. The fruit spurs and limbs are more prominent on the older wood of the tree, especially on the inside. As the tree becomes older the fruit on these spurs becomes smaller and greener in color, consequently less desirable for commercial purposes. Then these spurs should be cut out from the inside of the tree so that the crop will be borne farther out on the limbs, where the sun may get to the fruit in order to color it. Ten boxes of big red apples are worth more than twenty boxes of the good, bad and indifferent variety. As apple trees become older they of course become larger and taller. It is necessary to keep them

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

close enough to the ground in order that the crop may be sprayed, thinned and picked at the minimum amount of expense. After trees get so tall that the fruit cannot be picked from the top round of a sixteen-foot ladder it is high time that they were cut back to a reasonable height.

When young trees begin to bear heavily the limbs are rather long and slim, and of course are very easily bent. As fast as possible these limbs should be cut back, preferably to a side limb in order to stiffen them up. By cutting to side limbs, the number of sprouts as a result of the topping is reduced largely. Always remember that cutting back during the dormant period induces wood growth and is detrimental to the forming of fruit spurs. A tree cannot grow fruit spurs and make a good wood growth at the same time. Consequently if trees are making heavy growths of wood and are bearing light crops of fruit do not prune them back heavily during the dormant period. If, on the other hand, the trees have arrived at the age when they bear heavy crops of fruit and do not make much of a wood growth then prune heavily, especially so in years of heavy crops. This will help in a large degree to save in the cost of thinning, will give larger fruit and better color. Remember, prune heavily when the crop is heavy and lightly when the crop is light.

Along the sides of the main limbs are innumerable fruit limbs and spurs. Many of these are quite long and some of them crossing one another perhaps. Cut these back some also, so that they stand out along the limb quite stiffly. This will keep the apples from limb bruising and whipping. Being careful in this matter will cause the crop to be much larger in the percentage of extra fancy apples. It helps the sun to get to the fruit and helps very materially in the spraying of the tree. In spite of pruning, thinning and propping, limbs are bound to hang pretty low and often get into heavy clusters of leaves and fruit. When this occurs the apples that are underneath do not get their proper share of sunshine and as a result are light colored. With a small pair of pruning shears cut away leaves and superfluous twigs and a surprise will be in store on account of the rapidity in which these apples take on color. This should be done at the close of the hot weather of summer, else the apples may sun-scald. When red apples are worth twenty-five cents per box more than pale ones a great many quarters may be saved in the course of a day by one man's work, besides having the satisfaction of having something to offer.

In cutting small limbs cut near the bud, but not too close, else the wood may dry back and the bud be destroyed. In cutting large limbs cut close to the body of the tree so as to leave no stubs. All cuts of an inch or more should be painted with white lead, wax or something that will exclude the weather. In top-grafting cut back all the limbs

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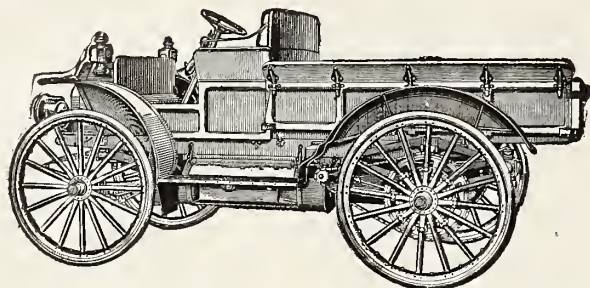
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that are to be grafted, allowing all the side branches and shoots below to remain. See that these shoots and limbs as they grow do not overshadow the growth of the grafts, but keep them pinched back, allowing all to grow that will. In this way no loss will result from sun-scald or sour sap, there being enough leaves to elaborate the sap so that it does not become stagnant.

Excessive fruiting may be controlled by the cutting away of a part of the wood growth of the preceding year. As a rule the wood of a tree becomes two years old before the fruit is borne on it, so by cutting away a part of the new wood the crop of the following year is reduced, hence a saving in the cost of thinning. As a tree becomes older the fruit-bearing area becomes larger, that is the number of spurs increases, consequently it becomes harder for the tree to mature its crop, as there are so many apples, and they are bound to be small. Always remember that it is the seeds of the apple that depletes the strength of the tree and not the size of the apple. Ten boxes of apples, eighty-eight to the box, will not be so hard on the tree as ten boxes one hundred and eighty-eight to the box. The chances are that with the ten boxes of larger apples there will be a crop on the tree the following year, while with the smaller apples there will be a very small crop, or possibly none at all.

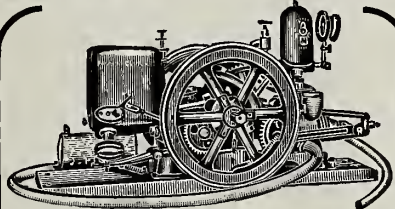
Summer pruning is not practiced very much, either because we are too busy at that time or else we do not know much about it. Summer pruning is like taking strong medicine, better have someone administer it who understands the business. In the Yakima Valley, where trees are so prolific at so early an age, it is a question as to how to keep them from overbearing rather than to force them to bear. However, there are some varieties, such as Spitzenberg and Yellow Newtown Pippin, that are slow to come into bearing. These may be cut back during the latter part of the growing season, preferably from the first to the middle of August, as it is at this time that the fruit buds are formed for the next season. This topping should be done only after the trees are five or six years old. Young trees that are making very vigorous growths may be cut back in June. This will cause the side branches to develop and will give the tree a more rounding top rather than an upright one.

As the tree is pruned, make a study of its characteristics. It will be discovered that there is a difference in the varieties of trees as to their manner of growth. The fruit spurs being in some instances on the main limbs, such as with the Spitzenberg, others on short spurs, as with the Yellow Newtown Pippin, while again they are found on long fruit limbs, as with the Jonathan, or out toward the tips of the limbs, as with the Rome Beauty. All these characteristics are as pronounced as the apples themselves. It behooves the grower, therefore, to acquaint himself with the different varieties, and in

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caring for them he will soon see that each requires a somewhat different method of pruning. The same method to get a Leghorn to lay will not make a Plymouth Rock lay. Neither is a Jersey fed the same as a Shorthorn. All trees as they grow older have a tendency to produce smaller fruit. Some are more inclined than others, such as the Jonathan, Winesap and Wagener, while Rome Beauty, Ben Davis and Gano maintain their size for a longer period, hence it will be necessary to prune more heavily on the former group than the latter. In order to produce apples of good size those inclined to bear small fruit should make an annual growth of from twelve to eighteen inches, while the larger varieties should show from six to twelve inches.

In purchasing tools get the best. Be sure to have one of the swivel-blade saws, as a great deal of time may be saved; a good pair of heavy shears, preferably a Cronk; a good hook, but beware of the latest getups, as they are generally high priced and not as efficient as the old styles; and an ordinary priced pair of hand snips. These are about all the tools the average orchardist needs in pruning. In burning brush, a great deal of time may be saved by the construction of a skid out of a piece of sheet iron about four by six, mounted on iron runners. Hitch the horse well away from this with a chain. By building a fire on this arrangement and dragging it through the orchard the brush may be burned quite easily and a great deal quicker than in the old way.

Bitter Pit Investigation

[Written for "Better Fruit"]

A RECENT report that we have seen is entitled "Bitter Pit Investigation: The Past History and Present Position of the Bitter Pit Question." By D. McAlpine. First Progress Report. Melbourne, Australia. This report is very interesting, the term "bitter pit" being applied to a condition of fruit that is very common in the Pacific Northwest and which we most commonly term "dry rot," "brown rot," "fruit pit," "spot disease," etc. It may take many forms. At times the core turns brown or there may be merely an accumulation of brown spots around the core. At other times there are brown spots found all through the flesh of the apple. This condition has been on the increase in the Pacific Northwest the past few years and in some places is becoming so prevalent as to cause considerable alarm.

According to the report this trouble has been known in Australia since 1876 and was fully described in 1886. It became so bad in the early 90's that the government authorized investigation. The trouble has spread over the entire world, being reported from practically all countries where apples are grown. The author of the report made many careful observations and field studies and has inaugurated an elaborate set

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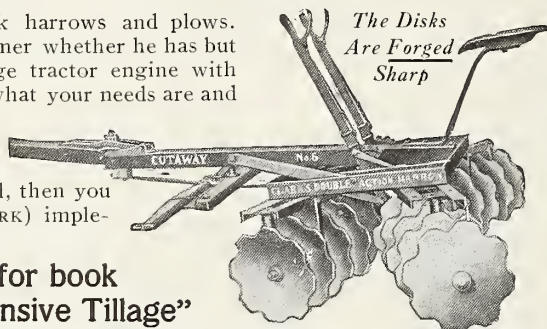
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of experiments. He has tried to determine the relation of the age of trees, the stage of growth when the trouble first appears, the relation of the pit to the size of the crop, its relation to soil, to the use of fertilizers, to drainage, to methods of cultivation, to systems of pruning, to the influence of stock used, and to climate. The author cites fully the various conditions that are attributed as causing this trouble. The bulletin consists of 197 large pages and is splendidly illustrated.

The author's conclusions can be best shown in his summary, the most interesting parts of which I cite in the following: "It is shown that neither insects nor fungi, bacteria nor external agencies, such as spraying, are concerned in the production of bitter pit. Bitter pit is seen to be an internal disease due to internal causes and always found associated with the discolored vascular bundles. Pitted apples are produced on unsprayed trees and a chemical analysis of such apples revealed no trace of mineral poisons. It was found, as far as my investigations go, that the key to the solution of the bitter pit problem lay in the wonderful vascular system which permeates the core and the flesh, and the marvelous network of vessels just beneath the skin, their function being to regulate and equalize the distribution of food material at the periphery of the fruit, where the greatest and most rapid growth normally takes place. The earliest external appearance of bitter pit was noticed when the fruit was about the size of a walnut, but it generally occurs when the fruit is about half grown or approaching maturity. It generally occurs in the upper half of the fruit and towards the 'eye' end, and this is correlated with the openings in the skin being much more numerous in the upper than in the under portion. Chemical analysis shows that there is less water in the flesh of the upper portion. Bitter pit may be associated with wet or dry seasons, so long as they are intermittent and fluctuating in their character at the critical period of growth.

"The principal contributing factors to bitter pit are: (1) Intermittent weather conditions when the fruit is at a critical period of growth; (2) amount and rapidity of transpiration; (3) sudden checking of the transpiration at night when the roots are still active owing to the heat of the soil; (4) failure of supplies at the periphery of the fruit, followed by spasmodic and irregular recovery; (5) inequality of growth, so that the vascular network controlling the distribution of nutritive material is not regularly formed; (6) fluctuations of temperature when fruit is in store; (7) nature of variety. The weather cannot be controlled (excepting so far as a smoke blanket is allowed to drift over the orchard on frosty nights), but the soil and the tree and the fruit formed may be controlled to a large extent by cultivation, manuring, including green manuring, irrigation, the stocks used, and the method of

pruning. The relation of each of these factors to the development of bitter pit is being determined by means of experiments.

"Young and vigorous trees making rapid growth may have pitted fruit from the rapid transpiration and excessive growth interfering with the regular development of the vascular network. A light crop with abnormally large fruit is more liable to pit than a heavy crop of average sized fruit equally distributed over the tree. The apple, pear and quince are subject to bitter pit. Certain varieties of apples develop bitter pit in store when subjected to a fluctuating temperature and humid conditions. When apples, even very susceptible varieties, are kept at a temperature of from 30 to 32 degrees Fahrenheit the development of bitter pit is retarded."

Horticultural Meetings in Washington, D. C.

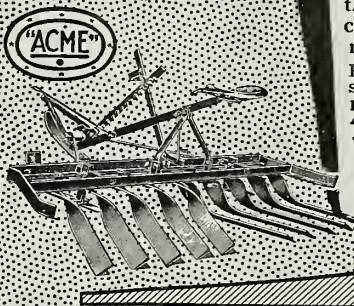
[Written for "Better Fruit"]

FOR two weeks I have been attending agricultural meetings in Washington. The first week, November 10th to 16th, did not directly concern the fruitgrower except that he naturally is interested in everything which benefits agriculture as a whole. These were the meetings of the Association of Agricultural Colleges and Experiment Stations. At these meetings questions of administration and questions concerning duplication of work were chiefly discussed. The strongest men from our agricultural colleges were there—presidents and directors for the greater part—and all giving the best that was in them to our great agricultural problems. I was interested in noting the increased interest in marketing problems shown by both the national government and state agricultural colleges, interest in destination, in better refrigerator cars and in better grading. It was pointed out that standardization must be our watchword. One speaker stated that much of the success of certain European co-operative movements was due to the fact that the product was standardized. We fruitmen on the Coast are feeling that is one of the greatest needs of our industry. The sooner we establish standards the sooner we will be able to build up a big substantial business.

I have spent several days studying the market condition of fruit here in the East, and while some good progress has been made nevertheless we are a long way from our goal, viz., making conditions such that the common people, so to speak, the average American, can afford to eat our apples. The dining cars and restaurants are now getting from ten to twenty-five times as much for a baked apple as the grower gets, yet there is not such a wide margin in meat, vegetables, potatoes, etc. The fruit stands are getting five cents apiece, or fifty cents a dozen, for our Western fruit, which is often second grade. This forces many a man to buy the cheaper oranges and bananas. The cheapest Western apple

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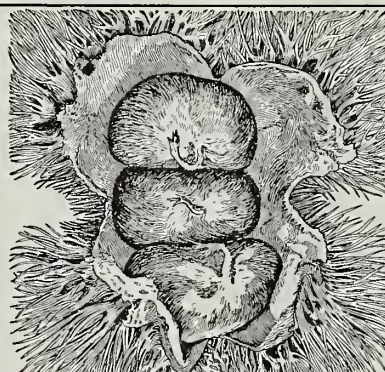
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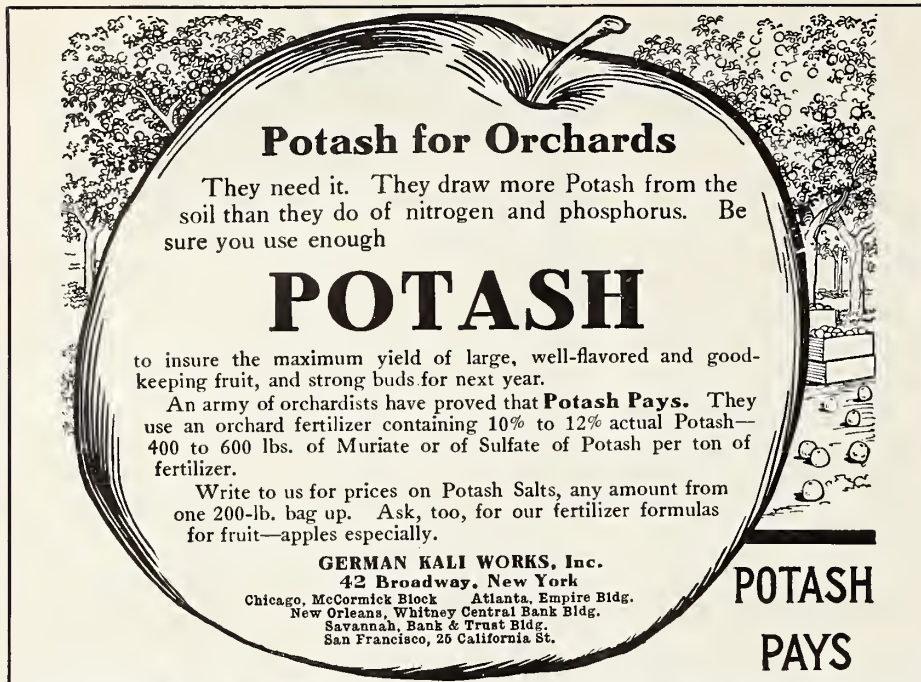
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LARS O. HAUG, Secretary,
550 Temple Court, Minneapolis, Minn.

S. O. OLSTAD, General Manager
119-121 S. 3rd St., Minneapolis, Minn.

I have seen retailed were nineteen small Jonathans for thirty-five cents. I want to relate here something that happened last week. Two gentlemen staying at a hotel in Washington decided one morning they would not eat any breakfast, but would order six apples brought to the room. With the six apples came a bill for \$1.75. The men remonstrated, but were told the apples were twenty-five cents apiece and there was an extra charge of twenty-five cents for delivering same to room.

Poor grade Eastern apples are selling for \$1.60 per bushel. Barreled apples are worth about \$4 to \$6, while box apples are bringing \$2.50 to \$4 per box. I noted that a number of Pacific Northwest regions sent attractive advertising material. The attractive lithographs in the boxes are doing much to advertise the Western apple.

From November 17th to 22nd there were two fruit capitals in the United States, Spokane with its National Apple Show, and Washington, D. C., with four societies of horticultural meetings, viz., the American Pomological Society, the Eastern Fruitgrowers' Association, the Northern Nutgrowers' Association and the Society of Horticultural Science. These organizations have all had good programs and in their papers and discussions have touched on all phases of horticulture, and have wrestled with about every problem that the fruit-growers have to confront. Reports of these meetings will be published and be made available for those who care to purchase the reports.

I want, however, to call attention to the exhibits, which were very interesting and instructive. I want to mention first the seedling apples. A number of men are giving much attention to this subject. The New York Experiment Station at Geneva had an exhibit of apples, including six new varieties, that they have considered worthy of naming. The Canadian Experimental Farms at Ottawa, Ontario, had on display a large number of promising seedlings of such varieties as Northern Spy, McIntosh Red, Golden Russet, Salome, Lawver and Fameuse. One of the most interesting exhibits was shown by the Missouri Experiment Station of Mountain Grove, Missouri. In this display were many seedlings obtained by crossing Ben Davis and Jonathan. It was interesting to note the wide variation. Mr. Charles G. Patten had a number of new varieties of apples that he had originated at Charles City, Iowa. The Department of Agriculture had two large exhibits, a display of grapes, about two hundred plates that had been gathered from all over the United States, and also a splendid nut collection—English walnuts, pecans and filberts forming the greater part. The filberts had been grown by the Oregon Experiment Station.

There was a large display of apples collected from nearly all parts of the United States. While some boxed fruit was shown, the display was mostly on plates, and unfortunately a plate exhibit does not really represent what a region can do. It is possible to pick a

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East Tenth and Pine Streets, PORTLAND, OREGON

prize-winning plate from nearly any apple tree. The real question is what percentage of your crop is as good as the plate exhibit.

The states showing apples were Massachusetts, New Jersey, Virginia, West Virginia, North Carolina, Missouri, Connecticut, Utah, Idaho, Montana and Washington, and also Canada. The Western fruit was not up to our best standards, was too large, often poorly colored and bruised, but on the whole was creditable. The fruit from Virginia and West Virginia, on the whole, was too large, but highly colored. The Stayman Winesap, as grown in that section, is very good, while the Winesap and Arkansas Black are both attractive. The Massachusetts exhibit was very attractive, being of good commercial size and well colored. A feature that attracted considerable attention in the New Jersey exhibit was a collection of cranberries of named varieties.

Probably by far the most attractive exhibit was made by Florida, oranges, lemons and grapefruit of all sizes and shapes. A splendid showing of persimmons, pineapples, avocado, papaya, carissa and other sub-tropical fruits.

All in all the display was very creditable and worth while taking a long journey to see. There is not a horticulturist in America but could learn much by attending the meeting and studying the exhibit.

New Leaf-Rolling Pest

As though there were not already enough pests to plague the Oregon fruitgrower, a new species of harmful insects has been recorded by Professor H. F. Wilson, entomologist of the Oregon Agricultural College. It is the leaf roller that is known to scientists as *Archips argyrophilia*. The larvae were first observed by Professor Wilson in 1911, but not until the present season were all stages studied and connected.

"The insect has undoubtedly been in Oregon for a long period of years," says Professor Wilson, "and is now found in various parts of the Willamette Valley and in the fruit-growing sections surrounding Hood River, The Dalles and Mosier. This preliminary report is made in order to meet the demands for information concerning a small greenish 'worm' that causes serious injury by eating out small sections of young fruit.' In Oregon the injury has not been so extensive as in Colorado and New York. I have observed the larvae feeding on the inside of the bud, often destroying the tip of a shoot. As the leaves unfold each larva confines itself to a single leaf, one side of which it rolls and fastens down with silken threads. This serves as a nest.

TARRED ORCHARD YARN

Orchardists who are down-to-the-minute in methods of caring for trees are using Orchard Yarn for supporting limbs and shaping trees. The best time for tying has been demonstrated to be when trimming and before leafing begins. All experienced growers agree that early attention is advantageous. There is no evidence that Yarn will be cheaper this year, and both time and labor can be saved by tying at pruning time.

TWO GRADES—MANILA AND SISAL

Manila Tarred Yarn, 1 and 2-ply, 10-lb. spools
Sisal Tarred Yarn, 1 and 2-ply, 10-lb. spools

Can be put in 5-lb. balls at $\frac{1}{4}$ c extra.

Put up in 50-lb. shipping packages. Supplied by all merchants.

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PORTLAND, OREGON

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Most Desirably Located. In the Center of Shopping and Theatre District
Covers a City Block

Broadway, Sixth, Morrison and Yamhill Streets

EUROPEAN PLAN—\$1.00 per day and upward

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Write for Portland Hotel Booklet

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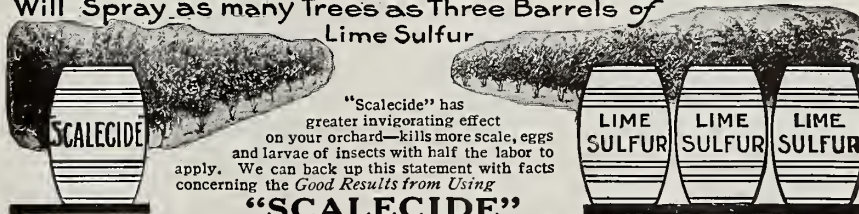
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Eleventh—off Washington St.

One Barrel of "Scalecide"
Will Spray as many Trees as Three Barrels of
Lime Sulfur



Send for our illustrated booklet—"Proof of The Pudding". Tells how "Scalecide" will positively destroy San Jose and Cottony Maple Scale, Pear Psylla, Leaf Roller, etc., without injury to the trees. Write today for this FREE book and also our booklet—"Spraying Simplified".

Our Service Department can furnish everything you need for the orchard at prices which save you money. Tell us your needs.
We are World Distributors for VREELAND'S "ELECTRO" SPRAY CHEMICALS and Arsenate of Lead Powder (33 per cent), which, used wet or dry, has no equal in strength or texture. Avoid imitations.
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Is death to all leaf-eating insects.
By its use you can

Save your fruit, vegetables, potatoes,
berries, truck gardens.

HIGHEST QUALITY

Not always lowest in price, but
cheapest in the end. 15 years' ex-
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Take no other brand but insist on
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making a new kind of paint without the use
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quired is cold water to make a paint weather-
proof, fireproof and as durable as oil paint.
It adheres to any surface, wood, stone or
brick, spreads and looks like oil paint and
costs about one-fourth as much.

Write to Mr. A. L. Rice, manufacturer, 255
North Street, Adams, N. Y., and he will send
you a free trial package, also color card and
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save a good many dollars. Write today.

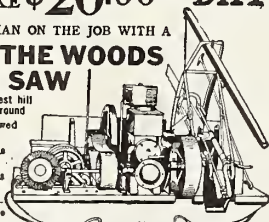
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MAKE \$20.00 A DAY

AND JUST ONE MAN ON THE JOB WITH A
KING OF THE WOODS
DRAG SAW

Pulls itself up the steepest hill
and over the roughest ground
One man writes he sawed
66 ricks in 10 hours
Another sawed 40 cords
in 9 hrs.
Another sawed 38 cords
in a day.

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machine will climb a tree
THERE IS MORE YOU
SHOULD KNOW.

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Reiersen Machinery Co.
Manufacturers, PORTLAND, OREGON.

Harvey Bolster Springs

make any wagon a spring wagon. Prevent
damage to eggs, fruit, etc., on road to market. Soon
save cost—produce brings more—wagon lasts longer.
MADE LIKE FINEST AUTO SPRINGS

Very resilient and durable. The standard springs of
America since 1889. 40 sizes—fit any wagon—
sustain load up to 5 tons. If not at dealer's,
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GUARANTEED

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

We have not observed them feeding on
the fruit, but from the reports of grow-
ers there seems little doubt that they
cause most of such fruit injury in this
state. Eggs are deposited anywhere on
the bark in masses about one-fifth inch
square, which are then smeared over
with a dark-colored substance that
blends them with the bark, making
them almost indistinguishable. The
masses vary in number from twenty to
over one hundred and fifty, and the egg
stage lasts from June, when they are
deposited, until April or May of the fol-
lowing year.

"The larvæ mature in the shells
some time before they emerge, which
is generally during the first warm
weather after the buds begin to open.
At the time of hatching they measure
about one-twentieth of an inch in
length and are of a dirty yellow color,
except the head, which is black. They
are quite active from the first, and if
their nest is opened they quickly
wiggle out and hang suspended by a
silken thread. The mature larvae are
about an inch in length. The head is
shining black, with the first segment
back of it having a light green border.
The adjoining two-thirds of the body
is dark green, the remainder yellowish
green. The feet are glistening black.
The last pro-legs and the last body seg-
ment are yellow.

"In the pupa stage the insect meas-
ures from three-eighths to one-half
inch in length and is light brown, the
under side shaded with green. The top
of each abdominal segment is fitted
with two rows of saw-like spines that
point backward. The middle spines
are quite prominent, while the terminal
ones are not so well developed. The
adult moth is a dark, rusty red, varie-
gated with obscure silvery patches,
each front wing bearing two bright
spots. Some are darker than others,
and two adults that emerge from the
same egg cluster may not resemble each
other in color at all. They emerge dur-
ing June, the egg masses being pro-
duced soon afterward. An important
control measure in Oregon is winter
pruning, as most of the egg masses are
formed on the smaller branches and
twigs. Enough may remain to cause
great damage, and spraying may be-
come necessary. Arsenical sprays are
less valuable for this than for most
leaf-eating insects, and the treatment
of Professor C. P. Gillette, for Colo-
rado conditions, is recommended:
Make a spraying application of a good
soluble oil shortly before the eggs
hatch. Should this fail to kill the eggs
make two applications of an arsenical
or a Black Leaf-40 spray."—Exchange.

Almost the whole world knows of
Hood River as a place that produces
the best fruits, and all of Hood River
Valley should know, and could know,
that there is one place in Hood River,
under the firm name of R. B. Bragg &
Co., where the people can depend on
getting most reliable dry goods, cloth-
ing, shoes and groceries at the most
reasonable prices that are possible.
Try it.

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Reliable Certification Insures
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The Ballygreen System of Pedigreed Fruit Trees

enables Planters to secure
selected strains. Endorsed
by leading Horticulturists and
Fruit Growers.

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Salesmen Wanted.



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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The World

Our Orchard

\$476,322.94

During the fiscal year just ended,

Steinhardt & Kelly

paid to the various trunk lines entering New York City the total sum of *Four hundred seventy-six thousand three hundred twenty-two dollars ninety-four cents* for freight

This is probably the largest sum that has ever been paid by one fruit firm to the railroads for freight service in the same period.

Every carload in this traffic procession was our own property, selected by ourselves in the production districts for quality, and purchased on a strict f.o.b. basis for our discriminating trade.

Twenty years ago the firm of

Steinhardt & Kelly

was but in the making.

Ten years ago it was relatively a small firm, but with a clear, consistent policy of rendering high-class service to the metropolitan purchasing trade.

Five years ago the maintenance of this business policy led the firm to improve its service by selection of supplies at the source and their control on the f.o.b. basis, and it is extremely gratifying to us to be able to announce this tremendous increase in our business because it has largely taken place since we undertook aggressively to develop on this modern, business-like line. It could not have been achieved by us without the hearty co-operation and simultaneous growth of the producers and our customers in the trade. Our growth has been greatest in the period of the soundest development of the fine fruit industry, and we believe that, remarkable as are the results indicated by the above figures from our transactions of 1913, they are but a guide-post on the road to still greater results for the industry, the trade and ourselves.

Our Market

The World

STARK TREES AT LOUISIANA, MO. SINCE 1816

Stark Delicious

—the apple triumph of two centuries—is only one feature of Stark Bros. Year Book for 1914.

The book is beautiful indeed — with its *actual color reproductions* of Stark Delicious and other fruits that are *standard money-makers* wherever grown — with its photographic illustrations of all Stark Bros. successful varieties.

It is a valuable book because of the *helpful orchard information* it gives.

If you are already a big grower, in search of new blood for your orchard—if you expect to plant an orchard for family use or profit—this book will help you in making your selections.

Stark Bros. Splendid New Year Book for 1914—Free

is a complete, dependable guide.

Write *today* asking for it, and telling us what you hope to plant during the coming year.

We will send you also a copy of the new Stark Orchard and Spray Book—*free*—a remarkable work for every grower—a *book of authority* on modern practical spraying and general care of the orchard.

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Actual size—
Weight, 13 oz.